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UNITED STATES GOVERNMENT  
THROUGH**











ANNUAL REPORTS, WAR DEPARTMENT

FISCAL YEAR ENDED JUNE 30, 1907

REPORT OF THE  
CHIEF OF ENGINEERS  
U. S. ARMY

1907

IN THREE PARTS  
PART II



WASHINGTON  
GOVERNMENT PRINTING OFFICE  
1907



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**APPENDIXES**  
**TO THE**  
**REPORT OF THE CHIEF OF ENGINEERS,**  
**UNITED STATES ARMY**  
**(CONTINUED).**

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## APPENDIX E.

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IMPROVEMENT OF RIVERS AND HARBORS IN NEW YORK ON LONG ISLAND SOUND AND ON THE SOUTHERN SHORE OF LONG ISLAND, OF HUDSON RIVER AND HARBORS THEREON, AND OF HARLEM AND EAST RIVERS, NEW YORK.

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REPORT OF COL. JOHN G. D. KNIGHT, CORPS OF ENGINEERS, OFFICER IN CHARGE, FOR THE FISCAL YEAR ENDING JUNE 30, 1907.

### IMPROVEMENTS.

- |  |   |
|--|---|
| 1. Port Chester Harbor, New York.  | 9. Newtown Creek, New York.   |
| 2. Mamaroneck Harbor, New York.  | 10. Browns Creek, New York.   |
| 3. Larchmont Harbor, New York.   | 11. Great South Bay, New York.  |
| 4. Echo Bay Harbor, New York.  | 12. Hudson River, New York.   |
| 5. Bronx River and East Chester Creek, New York.   | 13. Saugerties Harbor, New York.  |
| 6. Harbors at Port Jefferson, Mattituck, Huntington, Glencove, Flushing Bay, Canarsie Bay, and Sag Harbor, New York. | 14. Harbors at Rondout and Peekskill, New York.                             |
| 7. East River and Hell Gate, New York.   | 15. Wappinger Creek, New York.  |
| 8. Harlem River, New York.   | 16. Tarrytown Harbor, New York.   |
|  | 17. Coney Island channel, New York.   |
|  | 18. Removing sunken vessels or craft obstructing or endangering navigation. |
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UNITED STATES ENGINEER OFFICE,  
*New York City, July 9, 1907.*

GENERAL: I have the honor to forward herewith annual reports upon works of river and harbor improvements in New York, for the fiscal year ending June 30, 1907.

\* \* \* \* \*

Very respectfully, your obedient servant,

JOHN G. D. KNIGHT,  
*Colonel, Corps of Engineers.*

Brig. Gen. A. MACKENZIE,  
*Chief of Engineers, U. S. A.*

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### E 1.

IMPROVEMENT OF PORT CHESTER HARBOR, NEW YORK.

OPERATIONS DURING THE PAST FISCAL YEAR.

None. A detailed survey of ledge rock is to be made before advertising for proposals for dredging and rock removal.

*Money statement.*

Amount appropriated by river and harbor act approved March 2, 1907. \$6,500.00  
 July 1, 1907, balance unexpended..... 6,500.00

{ Amount that can be profitably expended in fiscal year ending June 30, 1909, for maintenance of improvement, in addition to the balance unexpended July 1, 1907..... 2,500.00  
 Submitted in compliance with requirements of sundry civil act of June 4, 1897, and of section 7 of the river and harbor act of 1899.

## APPROPRIATIONS.

## For previous project :

June 10, 1872.....	\$12,000
August 2, 1882.....	15,000
August 11, 1888.....	5,000
September 19, 1890.....	5,000
July 13, 1892.....	5,000
August 18, 1894.....	5,000
June 3, 1896.....	5,000
	<b>\$52,000</b>

## For present project :

March 3, 1899.....	25,000
June 13, 1902.....	5,000
March 3, 1905.....	3,000
March 2, 1907.....	6,500
	<b>39,500</b>

Total.....	<b>91,500</b>
------------	---------------

## COMMERCIAL STATISTICS.

*Vessels employed in trade in 1906.*

Class.	Trips made.	Tonnage.	Draft.
			<i>Feet.</i>
Steamers .....	2,000	300	10
Sailing vessels.....	350	800	13
Barges, etc .....	1,200	800	14

Passengers carried : None, with the exception of a few excursions.

*Freight handled, 1906.*

Articles.	Tons.	Value.	Articles.	Tons.	Value.
General merchandise .....	80,000	\$4,960,000	Building materials .....	110,000	\$660,000
Iron .....	25,000	1,000,000	Total.....	265,000	6,870,000
Coal and other fuel .....	50,000	250,000			

\* Decrease as compared with 1905 due to strike and subsequent failure to obtain full supply of raw material.

## E 2.

## IMPROVEMENT OF MAMARONECK HARBOR, NEW YORK.

## OPERATIONS DURING THE PAST FISCAL YEAR.

No work was done during the year, there being no funds available.

*Money statement.*

Amount (estimated) required for completion of existing project..... \$7, 628. 50

{	Amount that can be profitably expended in fiscal year ending June 30, 1909, in addition to the balance unexpended July 1, 1907:		
	For works of improvement.....	\$7, 628. 50	
	For maintenance of improvement.....	2, 500. 00	
			10, 128. 50

Submitted in compliance with requirements of sundry civil act of June 4, 1897, and of section 7 of the river and harbor act of 1899.

## APPROPRIATIONS.

August 2, 1882.....	\$15, 000
July 3, 1896.....	10, 000
March 3, 1899.....	7, 000
June 13, 1902.....	6, 000
March 3, 1905.....	2, 000
<b>Total.....</b>	<b>40, 000</b>

## COMMERCIAL STATISTICS.

*Vessels employed in trade in 1905.*

Class.	Trips made.	Tonnage.	Draft.
Steamers.....	30		<i>Fed.</i> 9
Sailing vessels.....	2	183	6- 6½
Barges, etc.....	41	100-700	5-10

*Freight handled, 1906.*

Articles.	Tons.	Value.	Articles.	Tons.	Value.
General merchandise.....	250	\$20, 000	Horses.....	500	\$50, 000
Coal and other fuel.....	11, 800	57, 000	Total.....	15, 756	181, 090
Crushed stone.....	2, 206	8, 090			
Fertilizer.....	1, 000	1, 000			



## E 3.

## IMPROVEMENT OF LARCHMONT HARBOR, NEW YORK.

## OPERATIONS DURING THE PAST FISCAL YEAR.

None. Disbursements were mainly in payment for work under contract completed May 29, 1906. A detailed survey of ledge rock is to be made before advertising for proposals for rock removal.

*Money statement.*

July 1, 1906, balance unexpended.....	\$4, 997. 95
Amount appropriated by river and harbor act approved March 2, 1907.....	14, 000. 00
	<hr/> 18, 997. 95
June 30, 1907, amount expended during fiscal year, for works of improvement .....	4, 159. 18
July 1, 1907, balance unexpended.....	<hr/> 14, 838. 77
Amount (estimated) required for completion of existing project.....	<hr/> 29, 000. 00
<hr/>	
{ Amount that can be profitably expended in fiscal year ending June 30, 1909, for works of improvement, in addition to the balance unexpended July 1, 1907.....	
Submitted in compliance with requirements of sundry civil act of June 4, 1897.	
	9, 000. 00

## APPROPRIATIONS.

For previous project:	
September 19, 1890.....	\$5, 000
	<hr/> \$5, 000
For present project:	
March 3, 1899.....	50, 000
June 13, 1902.....	10, 000
March 3, 1905.....	5, 000
March 2, 1907.....	14, 000
	<hr/> 79, 000
Total .....	<hr/> 84, 000

## COMMERCIAL STATISTICS.

Number of vessels other than yachts entering harbor of refuge, or for the night, during 1901 (estimated), 850.

Draft of such vessels, 4-18 feet.

Tonnage of such vessels, 100-500 tons.

*Freight discharged in Larchmont Harbor in 1901.*

Number of cargoes.....	150
Amount in tons.....	15, 500

*Vessels owned by the Larchmont Yacht Club, 1901.*

[Draft, from 3 to 22 feet; tonnage, from 3 to 600 tons.]

Steamers .....	86
Schooners .....	51
Sloops .....	160
Smaller boats.....	66
Total.....	<hr/> 363

## E 4.

## IMPROVEMENT OF HARBOR AT ECHO BAY, NEW YORK.

## OPERATIONS DURING THE PAST FISCAL YEAR.

Under contract with John and Joseph McSpirit, dated January 4, 1907, the removal of Long Rock was commenced January 10, 1907. The contract was completed May 17, 1907, 870.66 cubic yards of ledge rock having been removed, resulting in a channel 6 feet deep and 120 feet wide at Beauford Point.

*Money statement.*

July 1, 1906, balance unexpended.....	\$8,453.32
Amount appropriated by river and harbor act approved March 2, 1907.....	12,000.00
	<hr/> 20,453.32
June 30, 1907, amount expended during fiscal year, for works of improvement .....	7,777.86
July 1, 1907, balance unexpended.....	<hr/> 12,675.46

## APPROPRIATIONS.

June 18, 1878.....	\$10,000	June 13, 1902.....	\$17,000
March 3, 1879.....	3,000	March 2, 1907.....	12,000
June 14, 1880.....	3,000		
March 3, 1881.....	3,000	Total.....	<hr/> 51,000
August 2, 1882.....	3,000		

## CONTRACT IN FORCE.

Name of contractor: John & Joseph McSpirit.

Date of contract: January 4, 1907.

Date of approval: January 8, 1907.

Date of commencement: February 14, 1907.

Date of completion: August 14, 1907.

Removing 812 cubic yards of ledge rock, at \$8 per cubic yard, prism measurement.

## COMMERCIAL STATISTICS.

*Vessels employed in trade in 1906.*

Class.	Trips made.	Tonnage.	Draft.
Steamers .....	1,040	113-200	<i>Fct.</i> 54-34
Barges, etc .....	180	600	84-9

*Freight handled in 1906.*

Articles.	Tons.	Value.	Articles.	Tons.	Value.
General merchandise .....	72,150	\$1,462,000	Grain, flour, and feed.....	4,000	\$120,000
Iron .....	138	75,000	Fruit and farm products...	1,000	20,000
Coal and other fuel.....	107,754	474,814	Broken stone .....	1,031	522
Brick .....	15,000	105,000	Macadam .....	12,000	18,000
Cement, lime, and sand.....	25,332	120,272	Ashes, etc.....	1,000	1,000
Lumber and timber.....	80,000	375,000			
Hay and straw .....	1,000	17,500	Total.....	270,450	2,799,208

## E 5.

## IMPROVEMENT OF BRONX RIVER AND EAST CHESTER CREEK, NEW YORK.

## (A) BRONX RIVER, NEW YORK.

## OPERATIONS DURING THE PAST FISCAL YEAR.

Proposals for dredging were invited by advertisement November 28, 1906. The only bid received was 95 cents per cubic yard, scow measurement, for all material except bowlders and ledge rock, and \$15 per cubic yard, solid measurement, for bowlders. It was rejected.

A detailed survey of ledge rock is to be made before readvertising for dredging and rock removal.

*Money statement.*

July 1, 1906, balance unexpended.....	\$21,000.00
Amount appropriated by river and harbor act approved March 2, 1907.....	23,000.00
	44,000.00
June 30, 1907, amount expended during fiscal year, for works of improvement .....	375.84
July 1, 1907, balance unexpended.....	43,624.16
Amount (estimated) required for completion of existing project.....	6,485.00
<hr/>	
{ Amount that can be profitably expended in fiscal year ending June 30, 1909, in addition to the balance unexpended July 1, 1907:	
For works of improvement.....	\$6,485.00
For maintenance of improvement.....	5,000.00
	11,485.00
<hr/>	
{ Submitted in compliance with requirements of sundry civil act of June 4, 1897, and of section 7 of the river and harbor act of 1899.	

## APPROPRIATIONS.

June 3, 1896.....	\$10,000
March 3, 1899 .....	20,000
June 13, 1902 (allotment).....	5,000
March 3, 1905 (allotment).....	21,500
March 2, 1907 (allotment).....	23,000
Total .....	79,500

## COMMERCIAL STATISTICS.

*Vessels employed in trade in 1906.*

Class.	Trips made.	Tonnage.	Draft.
			<i>Fect.</i>
Steamers .....	800		
Sailing vessels .....	120	100	5½
Barges, etc .....	624	125-250	5-6½

*Freight handled in 1906.*

Articles.	Tons.	Value.	Articles.	Tons.	Value.
General merchandise .....	145	\$174,000	Cement, lime, and sand....	92,200	\$151,500
Iron .....	4,421	127,400	Lumber and timber.....	22,800	284,000
Coal and other fuel .....	130,972	610,197	Broken stone .....	5,500	38,000
Brick .....	80,500	320,000	Total.....	341,588	1,720,097
Building stone .....	5,000	15,000			

## (B) EAST CHESTER CREEK, NEW YORK.

## OPERATIONS DURING THE PAST FISCAL YEAR.

Proposals for dredging for maintenance were invited by advertisement November 28, 1906. The only bid received was 60 cents per cubic yard, scow measurement, for all material except boulders and ledge rock, and \$15 per cubic yard, solid measurement, for boulders. It was rejected.

Proposals were again invited by advertisement May 20, 1907, bids to be opened June 19, 1907. The lowest bid received was 33½ cents per cubic yard, scow measurement.

This bid was accepted and contract will be entered into.

*Money statement.*

July 1, 1906, balance unexpended.....	\$2,516.71
Amount appropriated by river and harbor act approved March 2, 1907.....	6,000.00
	8,516.71
June 30, 1907, amount expended during fiscal year, for maintenance of improvement.....	89.73
July 1, 1907, balance unexpended.....	8,426.98
July 1, 1907, outstanding liabilities.....	134.50
July 1, 1907, balance available.....	8,292.48
{ Amount that can be profitably expended in fiscal year ending June 30, 1909, for maintenance of improvement, in addition to the balance unexpended July 1, 1907.....	
Submitted in compliance with requirements of sundry civil act of June 4, 1897, and of section 7 of the river and harbor act of 1899.	
	5,000.00

## APPROPRIATIONS.

March 3, 1873-----	\$25,000	June 3, 1896-----	\$10,000
March 3, 1875-----	12,000	June 13, 1902 (allotment)----	3,000
June 18, 1878-----	10,000	June 13, 1902 (allotment)----	10,000
March 3, 1879-----	3,500	April 28, 1904 (allotment)---	2,500
June 14, 1880-----	3,500	March 3, 1905 (allotment)---	3,000
August 5, 1886-----	10,000	March 2, 1907 (allotment)---	6,000
August 11, 1888-----	5,000		
August 18, 1894-----	12,000	Total-----	115,500

## COMMERCIAL STATISTICS.

*Vessels employed in trade in 1906.*

Class.	Trips.	Tonnage.	Draft.
Steamers and gasoline power boats.....	692	82	7-8½
Sailing vessels.....	8	200	8
Barges, etc.....	1,006	100-700	6-8
Miscellaneous craft .....	6	.....	4

*Freight handled.*

Articles.	Tons.	Value.	Articles.	Tons.	Value.
General merchandise .....	200	\$20,000	Macadam .....	5,960	\$6,048
Iron .....	13,189	623,025	Gravel .....	750	750
Coal and other fuel.....	133,830	775,985	Petroleum .....	23,561	287,500
Brick .....	8,325	25,140	Tile, etc.....	1,998	32,041
Building stone .....	7,590	44,700	Rails and bridge steel .....	13,909	519,522
Cement, lime, and sand.....	5,885	16,758	Railroad ties.....	6,229	51,178
Lumber and timber.....	19,719	438,381	Ashes, garbage, etc.....	250	.....
Clay, pottery, etc.....	2,611	86,043			
Paving blocks.....	10,260	102,600	Total.....	282,655	3,063,860
Broken stone.....	28,439	33,739			

## E 6.

IMPROVEMENT OF HARBORS AT PORT JEFFERSON, MATTITUCK, HUNTINGTON, GLENCOVE, FLUSHING BAY, CANARSIE BAY, AND SAG HARBOR, NEW YORK.

## (A) PORT JEFFERSON HARBOR.

## OPERATIONS DURING THE PAST FISCAL YEAR.

Under contract with E. S. Belden & Sons, dated February 26, 1906, the work of repairing and enlarging the east breakwater, commenced on June 1, 1906, was completed August 6, 1906. Two thousand and thirty-four net tons of stone, at a total cost of \$2,705.22, were placed in the breakwater during the fiscal year, and 1,380 linear feet of the breakwater are now completed to the projected cross-section, except where covered by sand.

Proposals for extending the east breakwater were invited by advertisement dated June 10, 1907, bids to be opened July 10, 1907.

*Money statement.*

July 1, 1906, balance unexpended.....	\$9,726.71
Amount appropriated by river and harbor act approved March 2, 1907.....	24,000.00
	<hr/> 33,726.71
June 30, 1907, amount expended during fiscal year:	
For works of improvement.....	\$7,305.51
For maintenance of improvement.....	1,956.35
Repaid to U. S. Treasury.....	443.65
	<hr/> 9,705.51
July 1, 1907, balance unexpended.....	24,021.20
July 1, 1907, outstanding liabilities.....	21.20
	<hr/>
July 1, 1907, balance available.....	24,000.00
Amount (estimated) required for completion of existing project.....	48,473.29
	<hr/>
{ Amount that can be profitably expended in fiscal year ending June 30, 1909, in addition to the balance unexpended July 1, 1907:	
For works of improvement.....	\$10,000.00
For maintenance of improvement.....	2,500.00
	<hr/> 12,500.00
Submitted in compliance with requirements of sundry civil act of June 4, 1897, and of section 7 of the river and harbor act of 1899.	

## APPROPRIATIONS.

For previous projects:	
March 3, 1871.....	\$15,000.00
June 10, 1872.....	15,000.00
March 3, 1875.....	15,000.00
August 14, 1876.....	6,000.00
June 18, 1878.....	8,000.00
March 3, 1879.....	5,000.00
June 14, 1880.....	3,000.00
March 3, 1881.....	4,000.00
August 2, 1882.....	8,000.00
	<hr/> \$79,000.00
For present project:	
September 19, 1890.....	25,000.00
July 13, 1892.....	10,000.00
August 18, 1894.....	7,500.00
June 3, 1896.....	7,500.00
March 3, 1899.....	7,500.00
June 13, 1902 (allotment).....	10,500.00
April 28, 1904 (allotment).....	2,400.00
March 3, 1905 (allotment).....	8,500.00
March 2, 1907 (allotment).....	24,000.00
	<hr/> 102,900.00
Total.....	181,900.00
March 26, 1907, repaid to United States Treasury the unexpended balance of allotment of \$2,400, made from emergency act of April 28, 1904.....	443.65
	<hr/>
Net amount appropriated.....	181,456.35
Net amount appropriated for present project.....	102,456.35

## CONTRACT IN FORCE.

Name of contractor: E. S. Belden & Sons.  
Date of contract: February 26, 1906.  
Date of approval: March 13, 1906.  
Date of commencement: March 15, 1906.  
Date of completion: Time limit waived; completed August 6, 1906.  
For repairing and enlarging breakwater by delivery therein of 4,510 net tons of stone at \$1.33 per ton.

## COMMERCIAL STATISTICS.

*Vessels employed in trade in 1906.*

Class.	Trips made.	Tonnage.	Draft.
Steamers .....	3,680	.....	<i>Feet.</i> 9-10½
Sailing vessels .....	2,677	.....	5-7
Barges, etc .....	50	.....	7
Miscellaneous .....	400	.....	10

Passengers carried, 60,000.

*Freight handled.*

Articles.	Tons.	Value.	Articles.	Tons.	Value.
General merchandise .....	34,600	\$1,187,000	Fruits and farm products ..	8,405	\$121,300
Iron .....	1,800	80,000	Copper ore and products ..	2,050	76,875
Coal and other fuel .....	38,120	160,770	Chalk and whiting .....	25	375
Brick .....	3,800	15,600	Broken stone .....	300	300
Building stone .....	1,800	4,000	Oysters, clams, and fish ..	5,700	116,380
Cement, lime, and sand ..	1,970	10,100	Shells .....	1,000	1,935
Ice .....	800	1,000	Gravel .....	250	250
Lumber and timber .....	8,250	412,500	Petroleum .....	100	1,200
Hay and straw .....	205	4,100			
Grain, flour, and feed .....	10,530	300,930	Total .....	118,705	2,495,275

## (B) MATTITUCK HARBOR.

## OPERATIONS DURING THE PAST FISCAL YEAR.

Under contract with J. P. Randerson, dated December 27, 1906, for dredging, work was commenced May 20, 1907. Fifteen thousand seven hundred and thirty-six and one-half cubic yards of material were excavated to June 30, 1907, making a channel 7 feet deep at mean low water, 60 feet wide, and about 800 feet long between the jetties at the entrance.

*Money statement.*

July 1, 1906, balance unexpended .....	\$10,045.32
Amount appropriated by river and harbor act approved March 2, 1907 ..	40,000.00
	<hr/> 50,045.32
June 30, 1907, amount expended during fiscal year, for works of improvement .....	3,575.05
	<hr/> 46,470.27
July 1, 1907, balance unexpended .....	46,470.27
July 1, 1907, outstanding liabilities .....	4,758.92
	<hr/> 41,711.35
July 1, 1907, balance available .....	41,711.35
	<hr/>
July 1, 1907, amount covered by uncompleted contracts .....	1,306.96
Amount (estimated) required for completion of existing project .....	8,000.00
	<hr/>
Amount that can be profitably expended in fiscal year ending June 30, 1909, in addition to the balance unexpended July 1, 1907 :	
For works of improvement .....	\$8,000.00
For maintenance of improvement .....	3,000.00
	<hr/> 11,000.00
Submitted in compliance with requirements of sundry civil act of June 4, 1897, and of section 7 of the river and harbor act of 1890.	



## APPROPRIATIONS.

June 3, 1896.....	\$10,000
March 3, 1899.....	5,000
March 3, 1905 (allotment).....	20,000
March 2, 1907 (allotment).....	40,000
Total.....	75,000

## CONTRACT IN FORCE.

Name of contractor: J. P. Randerson.

Date of contract: December 27, 1906.

Date of approval: January 7, 1907.

Date of commencement: March 31, 1907.

Date of completion: August 1, 1907.

For dredging 19,700 cubic yards of material at 33 cents per cubic yard, scow measurement.

## COMMERCIAL STATISTICS.

*Freight handled in 1904.*

[Statistics for 1906 asked for, but none received.]

	Tons.		Tons.
General merchandise .....	15,952	Grain, flour, and feed.....	1,800
Coal and other fuel .....	3,900	Fruits and farm products.....	30,911
Building stone .....	458		
Lumber and timber .....	2,795	Total.....	56,602
Hay and straw .....	786		

Estimated value of 1904 tonnage, \$2,041,700.

## (C) HUNTINGTON HARBOR.

## OPERATIONS DURING THE PAST FISCAL YEAR.

None. Disbursements were mainly in payment for work under contract completed June 21, 1906. Proposals for dredging the channel where shoaling had occurred were invited by advertisement, May 20, 1907, bids to be opened June 19, 1907. The lowest bid received was 26 cents per cubic yard, scow measurement.

This bid was accepted and contract will be entered into.

*Money Statement.*

July 1, 1906, balance unexpended.....	\$2,064.72
Amount appropriated by river and harbor act approved March 2, 1907.....	3,500.00
	5,564.72
June 30, 1907, amount expended during fiscal year, for maintenance of improvement .....	2,086.32
July 1, 1907, balance unexpended.....	3,478.40
Amount that can be profitably expended in fiscal year ending June 30, 1909, for maintenance of improvement, in addition to the balance unexpended July 1, 1907.....	2,500.00
Submitted in compliance with requirements of sundry civil act of June 4, 1897, and of section 7 of the river and harbor act of 1899.	

## APPROPRIATIONS.

For previous project:		
June 10, 1872	-----	\$22, 500
For present project:		
September 19, 1890	-----	\$10, 000
July 13, 1892	-----	5, 000
August 18, 1894	-----	2, 000
June 3, 1896	-----	5, 000
March 3, 1899	-----	7, 500
June 13, 1902 (allotment)	-----	2, 500
March 3, 1905 (allotment)	-----	2, 500
March 2, 1907 (allotment)	-----	3, 500
		<u>38, 000</u>
Total	-----	60, 500

## COMMERCIAL STATISTICS.

*Vessels employed in trade in 1906.*

Class.	Trips made.	Tonnage.	Draft.
Steamers .....	1, 800	125-350	<i>Feet.</i> 6- 8½
Sailing vessels.....	375	50-300	5-12
Barges, etc .....	100	200	5- 7

*Freight handled.*

Articles.	Tons.	Value.	Articles.	Tons.	Value.
General merchandise.....	27, 050	\$1, 352, 500	Grain, flour, and feed.....	7, 362	\$300, 000
Coal and other fuel.....	20, 250	102, 500	Oysters, clams, and fish....	125	8, 750
Brick .....	550	2, 200	Fruits and farm products...	8, 000	179, 000
Cement, lime, and sand .....	1, 125	19, 900	Total.....	105, 212	2, 774, 850
Lumber and timber.....	87, 600	750, 000			
Hay and straw.....	8, 250	65, 000			

Number of passengers carried, 11,100.

## (D) GLENCOVE HARBOR.

## OPERATIONS DURING THE PAST FISCAL YEAR.

None. The small balance available on July 1, 1906, was paid out for office expenses and contingencies.

The present length of breakwater appears to afford sufficient protection to vessels seeking shelter from storms in this vicinity, and its further extension seems therefore to be unnecessary.

*Money statement.*

July 1, 1906, balance unexpended	-----	\$169. 72
June 30, 1907, amount expended during fiscal year, for works of improvement	-----	169.72
Amount (estimated) required for completion of existing project	-----	<u>63, 000. 00</u>

## APPROPRIATIONS.

August 11, 1888 .....	\$20,000	June 13, 1902 (allotment) .....	\$8,000
September 19, 1890 .....	15,000	March 3, 1905 (allotment) .....	3,000
July 13, 1892 .....	10,000		
August 18, 1894 .....	10,000	Total .....	72,000
June 3, 1896 .....	8,000		

## COMMERCIAL STATISTICS.

*Vessels employed in trade in 1906.*

Class.	Trips made.	Tonnage.	Draft.
Barges, etc .....	74	200	<i>Feet.</i> 54-6

*Freight handled.*

Articles.	Tons.	Value.
Coal and other fuel .....	7,062	\$18,000

## (E) FLUSHING BAY.

## OPERATIONS DURING THE PAST FISCAL YEAR.

A survey of the dike was made with a view of making such slight changes therein, where necessary, to render it less of an obstruction to navigation.

Proposals for continuing the improvement and for maintenance, by dredging, were invited by advertisement June 10, 1907, bids to be opened July 10, 1907.

*Money statement.*

July 1, 1906, balance unexpended .....	\$1,944. 64
Amount appropriated by river and harbor act approved March 2, 1907 .....	27,000. 00
	<u>28,944. 64</u>
June 30, 1907, amount expended during fiscal year, for maintenance of improvement .....	406. 80
July 1, 1907, balance unexpended .....	28,537. 84
July 1, 1907, outstanding liabilities .....	50. 00
July 1, 1907, balance available .....	<u>28,487. 84</u>
Amount (estimated) required for completion of existing project .....	<u>21,962. 12</u>
Amount that can be profitably expended in fiscal year ending June 30, 1909, in addition to the balance unexpended July 1, 1907:	
For works of improvement .....	\$10,000. 00
For maintenance of improvement .....	5,000. 00
	<u>15,000. 00</u>
Submitted in compliance with requirements of sundry civil act of June 4, 1897, and of section 7 of the river and harbor act of 1899.	

## APPROPRIATIONS.

March 3, 1879.....	\$20,000	July 13, 1892.....	\$10,000
June 14, 1880.....	15,000	August 18, 1894.....	4,000
March 3, 1881.....	10,000	June 3, 1896.....	4,000
August 2, 1882.....	5,000	June 13, 1902 (allotment).....	2,000
July 5, 1884.....	10,000	March 3, 1905 (allotment)---	10,000
August 5, 1886.....	10,000	March 2, 1907 (allotment)---	27,000
August 11, 1888.....	15,000		
September 19, 1890.....	20,000	Total.....	162,000

## COMMERCIAL STATISTICS.

*Vessels employed in trade in 1906.*

Class.	Trips made.	Tonnage.	Draft.
Steamers.....	1,402	100-400	Feet. 7-14
Sailing vessels.....	104	200-350	7-13½
Barges, etc.....	669	116-500	5-12

*Freight handled.*

Articles.	Tons.	Value.	Articles.	Tons.	Value.
General merchandise.....	12,150	\$2,083,450	Clay, pottery, etc.....	300	\$10,000
Iron.....	200	15,000	Broken stone.....	19,983	21,471
Coal and other fuel.....	114,317	431,558	Macadam.....	14,500	18,125
Brick.....	9,886	37,944	Gravel.....	550	360
Cement, lime, and sand.....	18,197	36,800	Ashes, garbage, etc.....	8,647	.....
Ice.....	5,854	23,416	Total.....	273,312	3,987,444
Lumber and timber.....	68,602	1,255,396			
Sulphur.....	126	4,925			

## (F) CANARSIE BAY.

## OPERATIONS DURING THE PAST FISCAL YEAR.

Because of the difficulty in securing a dumping place for the dredged material, which, owing to the limited depth of the improved channel, is carried in small scows unsuitable for towing to sea, and to unfavorable weather conditions, work under the contract with J. M. Briggs, which was to have commenced on November 9, 1906, after the completion of dredging in Great South Bay, was not commenced until May 7, 1907. The contract was completed June 17, 1907, 5,131.4 cubic yards having been removed thereunder, restoring the channel to its projected depth of 6 feet at mean low water and width of about 125 feet.

*Money statement.*

July 1, 1906, balance unexpended	\$2, 546. 04
Amount appropriated by river and harbor act approved March 2, 1907	4, 000. 00
	6, 546. 04
June 30, 1907, amount expended during fiscal year, for maintenance of improvement	2, 611. 76
July 1, 1907, balance unexpended	3, 934. 28
July 1, 1907, outstanding liabilities	139. 00
July 1, 1907, balance available	3, 795. 28
Amount that can be profitably expended in fiscal year ending June 30, 1909, for maintenance of improvement, in addition to the balance unexpended July 1, 1907	
Submitted in compliance with requirements of sundry civil act of June 4, 1897, and of section 7 of the river and harbor act of 1899.	3, 000. 00

## APPROPRIATIONS.

June 14, 1880	\$10, 000	August 18, 1894	\$2, 000
March 3, 1881	5, 000	June 3, 1896	10, 000
August 2, 1882	3, 000	June 13, 1902 (allotment)	5, 000
July 5, 1884	5, 000	March 3, 1905 (allotment)	2, 500
August 5, 1886	10, 000	March 2, 1907 (allotment)	4, 000
August 11, 1888	10, 000		
September 19, 1890	5, 000	Total	76, 500
July 13, 1892	5, 000		

## CONTRACT IN FORCE.

Name of contractor: J. M. Briggs.

Date of contract: May 21, 1906.

Date of approval: June 8, 1906.

Date of commencement: November 9, 1906.

Date of completion: Time limit waived; completed June 17, 1907.

For dredging 5,130 cubic yards of material, at 39 cents per cubic yard, scow measurement.

## COMMERCIAL STATISTICS.

*Vessels employed in trade in 1905.*

[Statistics for 1906 asked for, but full returns not received.]

Class.	Trips made.	Tonnage.	Draft.
Steamers	300	25-225	9-10
Sailing vessels	37	120-600	7-12½
Barges, etc	40	300-600	10-12

*Freight handled.*

Articles.	Tons.	Value.	Articles.	Tons.	Value.
General merchandise .....	50,000	\$1,000,000	Lumber.....	700	\$4,727
Coal and other fuel .....	34,860	191,247	Oysters .....	1,600	500,000
Brick.....	1,200	3,896	Total.....	95,460	1,714,022
Building stone .....	1,500	1,840			
Cement, lime, and sand.....	5,700	12,312			

## (G) SAG HARBOR.

## OPERATIONS DURING THE PAST FISCAL YEAR.

Under contract with E. S. Belden & Sons, dated January 4, 1906, the work of extending the breakwater, commenced March 19, 1906, was completed July 2, 1906. Two hundred and eighty net tons of stone were placed in the breakwater during the fiscal year. There is now 2,050 linear feet of breakwater completed to full cross section.

Proposals for continuing the improvement, by a further extension of the breakwater, were invited June 10, 1907, bids to be opened July 10, 1907.

*Money statement.*

July 1, 1906, balance unexpended.....	\$7,476.34
Amount appropriated by river and harbor act approved March 2, 1907.....	26,500.00
	<hr/> 33,976.34
June 30, 1907, amount expended during fiscal year, for works of improvement .....	7,069.15
	<hr/> 26,907.19
July 1, 1907, balance unexpended.....	12,704.00
Amount (estimated) required for completion of existing project.....	<hr/> 12,704.00
{ Amount that can be profitably expended in fiscal year ending June 30, 1909, for works of improvement, in addition to the balance unexpended July 1, 1907 .....	7,000.00
{ Submitted in compliance with requirements of sundry civil act of June 4, 1897.	

## APPROPRIATIONS.

June 13, 1902 (allotment).....	\$10,000
June 13, 1902 (allotment).....	3,500
March 3, 1905 (allotment).....	16,000
March 2, 1907 (allotment).....	26,500
	<hr/> 56,000
Total.....	2,296
Received on bond of failing contractor.....	<hr/> 58,296

## CONTRACT IN FORCE.

Name of contractor: E. S. Belden & Sons.

Date of contract: January 4, 1906.

Date of approval: January 9, 1906.

Date of commencement: March 1, 1906.

Date of completion: Time limit waived; was completed July 2, 1906.

For building breakwater by the delivery therein of 9,500 net tons of stone, at \$1.57 per ton.

## COMMERCIAL STATISTICS.

*Vessels employed in trade in 1905.*

Class.	Trips made.	Tonnage.	Draft.
Steamers .....	600	750	<i>Fed.</i> 10
Sailing vessels .....	124	50-800	6-13

*Freight handled, 1906.*

Articles.	Tons.	Value.	Articles.	Tons.	Value.
General merchandise .....	516	\$3,554	Clay, pottery, etc. ....	100	\$500
Coal and other fuel .....	8,571	35,811	Oysters, clams, and fish....	100	30,000
Brick .....	400	2,000	Macadam .....	400	800
Cement, lime, and sand .....	2,404	6,060	Gravel .....	1,800	8,600
Lumber and timber .....	4,250	144,750	Petroleum .....	200	8,000
Grain, flour, and feed .....	200	6,000	Total .....	19,041	238,275
Fruits and farm products ..	100	1,100			

## E 7.

## IMPROVEMENT OF EAST RIVER AND HELL GATE, NEW YORK.

## OPERATIONS DURING THE PAST FISCAL YEAR.

Proposals for 6,323 cubic yards of dredging and rock removal in Middle reef were invited by advertisement August 24, 1906. The only bid received was for a lump-sum price of \$127,750; it was rejected.

A piece of drifting wreckage was removed and broken up, at a total cost of \$98.02.

Detailed surveys of ledge rock are to be made before advertising for rock removal.

The following are the least depths, referred to mean low water, at localities where improvement has been partially completed:

Locality.	Least original depth.	Least depth June 30, 1906.
	<i>Fed.</i>	<i>Fed.</i>
Battery reef .....	17	19
Reef off South Ferry slips .....	17	19
Shell reef, off Ninth street .....	7.5	13
Ferry reef, off Thirty-fourth street .....	7	24
Middle reef, including Flood rock, etc. ....	+6	18.3
Heel Tap .....	12.1	20.5
Frying Pan .....	11	18
Pot rock .....	20	22.3

## The expenditures during the year were as follows:

For services and fuel for watchmen at Mill rock .....	\$1,302.50
Expenses attending advertising for removal of Middle reef resulting in receiving one excessive bid .....	161.80
Repair of plant .....	70.25
Part of expense of office and field force during July and August, 1906, when contract work at Mill rock was being provided for .....	980.33
Part of district administration pay rolls during remaining ten months ..	3,872.67
Map cases, typewriter, linoleum, filing cabinets, instruments, drafting supplies .....	608.47
Miscellaneous .....	377.46
<b>Total .....</b>	<b>7,373.48</b>

*Money statement.*

July 1, 1906, balance unexpended	\$160, 254. 58
Amount appropriated by river and harbor act approved March 2, 1907	250, 000. 00
	<u>410, 254. 58</u>
June 30, 1907, amount expended during fiscal year:	
For works of improvement	\$7, 275. 46
For maintenance of improvement	98. 02
	<u>7, 373. 48</u>
July 1, 1907, balance unexpended	402, 881. 10
July 1, 1907, outstanding liabilities	187. 50
	<u>402, 693. 60</u>
July 1, 1907, balance available	<u>454, 542. 32</u>
Amount (estimated) required for completion of existing project	<u>454, 542. 32</u>
<div> <div> Amount that can be profitably expended in fiscal year ending June 30, 1909, for works of improvement, in addition to the balance unexpended July 1, 1907 Submitted in compliance with requirements of sundry civil act of June 4, 1897. </div> <div>300, 000. 00</div> </div>	

## APPROPRIATIONS.

For previous project:	
By other than river and harbor acts prior to 1852	\$13, 861. 59
August 30, 1852	20, 000. 00
	<u>\$33, 861. 59</u>
For present project:	
July 25, 1868 (allotment)	85, 000. 00
April 10, 1869 (allotment)	176, 841. 45
July 11, 1870	250, 000. 00
March 3, 1871	250, 000. 00
June 10, 1872	225, 000. 00
March 3, 1873	225, 000. 00
June 23, 1874	214, 000. 00
March 3, 1875	250, 000. 00
August 14, 1876	250, 000. 00
June 18, 1878	350, 000. 00
March 3, 1879	250, 000. 00
June 14, 1880	200, 000. 00
March 3, 1881	200, 000. 00
May 4, 1882	50, 000. 00
August 2, 1882	200, 000. 00
July 5, 1884	360, 000. 00
August 5, 1886	112, 500. 00
August 11, 1888	250, 000. 00
September 19, 1890	200, 000. 00
July 13, 1892	150, 000. 00
August 18, 1894	75, 000. 00
June 3, 1896	60, 000. 00
March 3, 1899	250, 000. 00
June 13, 1902	100, 000. 00
March 3, 1905	200, 000. 00
March 2, 1907	250, 000. 00
	<u>5, 183, 341. 45</u>
Total	<u>5, 217, 203. 04</u>
Received from sale of condemned property:	
June 6, 1904	8. 25
December 27, 1904	1, 326. 00



## COMMERCIAL STATISTICS.

The commerce of the East River is so intimately connected with that belonging to New York Harbor proper that it is impracticable to make a separate statement of it.

## E 8.

## IMPROVEMENT OF HARLEM RIVER, NEW YORK.

## OPERATIONS DURING THE PAST FISCAL YEAR.

Under contract with Seely-Taylor Company, dated June 27, 1906, the dredging of a channel 150 feet wide and 15 feet deep, at mean low water, from McCombs Dam Bridge to the Hudson River was commenced July 18, 1906, and was completed December 22, 1906. A total of 122,080 cubic yards of material was removed under the contract at a cost of \$30,520. This dredging resulted in a continuous channel from McCombs Dam Bridge to Hudson River, 15 feet deep at mean low water and 150 feet wide. It is probable, however, that this channel has narrowed somewhat since the dredging was completed under the above contract.

Drilling and blasting ledge rock at McCombs Dam Bridge, by the use of Government plant and the hire of labor and purchase of materials in the open market, was resumed July 19, 1906, and was in progress at the close of the fiscal year. Much of the rock reported as ledge when surveyed, has proved to be loose rock removable by dredging.

Under open-market agreement with Taylor & Pearson, dated February 28, 1907, the removal of material overlying the ledge rock at McCombs Dam Bridge, and of blasted rock, was commenced March 13, 1907, and was still in progress on June 30, 1907. Two thousand and sixty-one cubic yards of rock and 17,209 cubic yards of mud, sand, gravel, and cobblestones were removed under this agreement at a total cost of \$16,160. This work resulted in clearing the ledge of a large quantity of material which had materially interfered with drilling and blasting operations carried on by Government plant.

*Money statement.*

July 1, 1906, balance unexpended.....	\$62, 448. 09
Amount appropriated by river and harbor act approved March 2, 1907.....	150, 000. 00
	<hr/> 212, 448. 09
June 30, 1907, amount expended during fiscal year, for works of improvement.....	64, 992. 35
	<hr/>
July 1, 1907, balance unexpended.....	147, 455. 74
July 1, 1907, outstanding liabilities.....	6, 142. 98
	<hr/>
July 1, 1907, balance available.....	141, 312. 76
	<hr/>
Amount (estimated) required for completion of existing project..	1, 155, 000. 00
	<hr/>
{ Amount that can be profitably expended in fiscal year ending June 30, 1909, for works of improvement, in addition to the balance unexpended July 1, 1907.....	300, 000. 00
{ Submitted in compliance with requirements of sundry civil act of June 4, 1897.	

# 1002 REPORT OF THE CHIEF OF ENGINEERS, U. S. ARMY.

## APPROPRIATIONS.

For previous project:

June 23, 1874 (allotment)-----	\$11,000	
March 3, 1875-----	10,000	\$21,000

For present project:

June 18, 1878-----	300,000	
March 3, 1879-----	100,000	
August 11, 1888-----	70,000	
September 19, 1890-----	250,000	
July 13, 1892-----	175,000	
August 18, 1894-----	125,000	
June 3, 1896-----	125,000	
March 3, 1899-----	100,000	
June 13, 1902-----	75,000	
March 3, 1905-----	75,000	
March 2, 1907-----	150,000	
		1,545,000
Total-----		1,566,000

## COMMERCIAL STATISTICS.

*Vessels employed in trade in 1905.*

Class.	Trips made.	Tonnage.	Draft.
Steamers .....	32,882	50-541	8-15
Sailing vessels .....	850	90-1,000	5-22
Barges, canal boats, lighters, etc. ....	26,051	90-700	4-20

*Freight handled, 1906.*

Articles.	Tons.	Value.	Articles.	Tons.	Value.
General merchandise ....	4,615,174	\$63,329,690	Grain, flour, and feed....	727,674	\$15,040,021
Iron .....	33,072	1,492,264	Oysters, clams, and fish..	6,100	628,609
Coal and other fuel .....	2,978,167	14,581,785	Macadam .....	36,013	28,800
Brick .....	224,618	808,502	Gravel .....	48,000	95,000
Building stone .....	77,325	765,628	Petroleum .....	52,150	717,212
Cement, lime, and sand ..	1,821,406	3,182,122	Ashes, garbage, etc .....	327,176	800
Ice .....	140,000	265,000			
Lumber and timber .....	184,240	2,988,904	Total .....	11,385,649	104,359,757
Hay and straw .....	114,534	435,480			

E 9.

## IMPROVEMENT OF NEWTOWN CREEK, NEW YORK.

### OPERATIONS DURING THE PAST FISCAL YEAR.

A survey of the creek for the purpose of determining where shoaling had taken place, in progress on June 30, 1906, was completed.

Under contract with Seely-Taylor Company, dated February 27, 1907, redredging the channel for maintenance was commenced March 28, 1907, and completed May 16, 1907. Eleven thousand one hundred and sixteen and eight-tenths cubic yards of material were removed

under the contract, restoring about 1,700 feet in length of channel, just below Greenpoint Avenue Bridge, to its projected depth of 18 feet at mean low water, for a width of 90 feet.

*Money statement.*

July 1, 1906, balance unexpended.....	\$4,790.54
Amount appropriated by river and harbor act approved March 2, 1907.....	5,000.00
Amount appropriated by sundry civil act approved March 4, 1907.....	15,000.00
	<hr/>
June 30, 1907, amount expended during fiscal year, for maintenance of improvement .....	24,790.54
	<hr/>
	4,756.33
July 1, 1907, balance unexpended.....	20,034.21
July 1, 1907, outstanding liabilities.....	34.21
	<hr/>
July 1, 1907, balance available.....	20,000.00
	<hr/>
{ Amount that can be profitably expended in fiscal year ending June 30, 1909, for maintenance of improvement, in addition to the balance unexpended July 1, 1907.....	10,000.00
{ Submitted in compliance with requirements of sundry civil act of June 4, 1897, and of section 7 of the river and harbor act of 1899.	

APPROPRIATIONS.

For previous project :

June 14, 1880.....	\$10,000
August 2, 1882.....	15,000
July 5, 1884.....	20,000
August 5, 1886.....	37,500
August 11, 1888.....	25,000
September 19, 1890.....	35,000
July 13, 1892.....	35,000
August 18, 1894.....	20,000
	<hr/>
	\$197,500

For present project :

June 3, 1896.....	30,000
June 4, 1897.....	183,000
June 13, 1902 (allotment of May 20, 1904).....	400
March 3, 1905.....	5,000
March 2, 1907.....	5,000
March 4, 1907.....	15,000
	<hr/>
	238,400
	<hr/>
Total .....	435,900

CONTRACT IN FORCE.

Name of contractor: Seely-Taylor Company.

Date of contract: February 27, 1907.

Date of approval: March 7, 1907.

Date of commencement: March 11, 1907.

Date of completion: June 11, 1907.

For dredging 11,200 cubic yards of material, at 31 cents per cubic yard, scow measurement.

## COMMERCIAL STATISTICS.

*Vessels employed in trade in 1906.*

Class.	Trips made.	Tonnage.	Draft.
Steamers .....	1,615	46-176	<i>Feet.</i> 9-14
Sailing vessels .....	1,071	55-800	6-18½
Barges, canal boats, and lighters .....	10,206	75-1,000	4-14

*Freight handled.*

Articles.	Tons.	Value.	Articles.	Tons.	Value.
General merchandise .....	134,223	\$12,709,490	Sulphur .....	3,720	\$78,060
Iron .....	77,785	4,416,050	Clay, pottery, etc .....	6,758	24,441
Coal and other fuel .....	1,137,835	4,078,684	Paving blocks .....	6,000	24,440
Brick .....	68,425	201,759	Chalk and whiting .....	70,542	417,613
Building stone .....	16,802	75,927	Broken stone .....	160	160
Cement, lime, and sand .....	104,004	749,111	Macadam .....	166	1,065
Ice .....	177,428	656,512	Petroleum, etc. ....	29,005	314,224
Lumber and timber .....	561,859	9,454,313	Slag .....	24,544	24,544
Hay and straw .....	268	5,010			
Grain, flour, and feed .....	2,191	63,155	Total .....	2,803,380	214,714,751
Copper ore and products .....	396,665	181,420,193			

## E 10.

## IMPROVEMENT OF BROWNS CREEK, SAYVILLE, LONG ISLAND, NEW YORK.

## OPERATIONS DURING THE PAST FISCAL YEAR.

None.

An examination of the locality is to be made before inviting proposals for dredging.

*Money statement.*

Amount appropriated by river and harbor act approved March 2, 1907- \$5,000. 00  
 July 1, 1907, balance unexpended..... 5,000. 00  
 Amount (estimated) required for completion of existing project..... 16,000. 00

{ Amount that can be profitably expended in fiscal year ending June 30,  
 1909, for maintenance of improvement, in addition to the balance  
 unexpended July 1, 1907..... 3,000. 00  
 Submitted in compliance with requirements of sundry civil act of  
 June 4, 1897, and of section 7 of the river and harbor act of 1899.

## APPROPRIATIONS.

September 19, 1890 .....	\$12,000	March 3, 1905 .....	\$3,000
July 13, 1892 .....	5,000	March 2, 1907 .....	5,000
August 18, 1894 .....	4,000		
June 3, 1896 .....	4,000	Total .....	36,000
March 3, 1899 .....	3,000		

## COMMERCIAL STATISTICS.

*Vessels employed in trade in 1906.*

Class.	Num-ber.	Ton-nage.	Draft.
Steamers and power boats.....	82	5- 50	<i>Fect.</i> 3-6½
Sailing vessels.....	156	3-100	2-7
Miscellaneous craft.....	16	5-100	1-4

*Freight handled.*

Articles.	Tons.	Value.	Articles.	Tons.	Value.
Fertilizers.....	160	\$1,900	Lumber.....	800	\$22,000
Coal and other fuel.....	1,200	8,100	Meadow hay.....	50	250
Brick.....	1,650	9,000	Potatoes.....	35	600
Oysters, clams, and fish.....	25,000	930,000	Gasoline.....	200	8,500
Broken stone.....	110	830			
Cement, lime, and sand.....	220	2,200	Total.....	29,675	983,880
Ice.....	250	1,000			

## E II.

## IMPROVEMENT OF GREAT SOUTH BAY, NEW YORK.

## OPERATIONS DURING THE PAST FISCAL YEAR.

Under contract with J. M. Briggs, dated May 21, 1906, dredging in Patchogue River was commenced August 13, 1906, and completed October 31, 1906. Fifteen thousand seven hundred and five and six-tenths cubic yards of material were removed under the contract.

On November 8, 1906, the contractor was about to begin work on Bar B in the bay when he was stopped by an injunction served upon him by parties interested in oyster beds at that locality. The injunction not having been dissolved up to the present time, work under the contract has not been resumed.

*Money statement.*

July 1, 1906, balance unexpended.....	\$8,179. 18
Amount appropriated by river and harbor act approved March 2, 1907.....	2,000. 00
	10,179. 18
June 30, 1907, amount expended during fiscal year, for maintenance of improvement.....	5,826. 26
July 1, 1907, balance unexpended.....	4,352. 92
July 1, 1907, outstanding liabilities.....	549. 70
	3,803. 22
July 1, 1907, balance available.....	
July 1, 1907, amount covered by uncompleted contracts.....	1,503. 03
Amount (estimated) required for completion of existing project.....	1,826. 26
{ Amount that can be profitably expended in fiscal year ending June 30, 1909, for maintenance of improvement, in addition to the balance unexpended July 1, 1907.....	2,000. 00
{ Submitted in compliance with requirements of sundry civil act of June 4, 1897, and of section 7 of the river and harbor act of 1890.....	

# 1006 REPORT OF THE CHIEF OF ENGINEERS, U. S. ARMY.

## APPROPRIATIONS.

For first project:		
September 19, 1890.....	\$15,000	
July 13, 1892.....	8,000	
August 18, 1894.....	4,000	
June 3, 1896.....	13,000	
		\$40,000
For present project:		
June 13, 1902.....	66,000	
March 3, 1905.....	2,000	
March 2, 1907.....	2,000	
		70,000
Total .....		110,000

## CONTRACT IN FORCE.

Name of contractor: J. M. Briggs.

Date of contract: May 21, 1906.

Date of approval: June 8, 1906.

Date of commencement: June 26, 1906.

Date of completion: Time limit waived; worked stopped by injunction November 8, 1906.

To dredge 20,000 cubic yards of material in Great South Bay and in Patchogue River, at 35 cents per cubic yard, scow measurement.

## COMMERCIAL STATISTICS.

### Vessels employed in trade in 1906.

Class.	Trips made.	Tonnage.	Draft.
Steamers .....	1,850	20-70	<i>Feet.</i> 8-5
Sailing vessels.....	7,500	8-300	3-8
Barges, etc .....	8,300	30-100	2-5

Number of passengers carried, 4,000.

### Freight handled.

Articles.	Tons.	Value.	Articles.	Tons.	Value.
General merchandise.....	89,000	\$320,000	Fish and oysters .....	5,500	\$154,000
Coal and other fuel.....	16,000	90,000	Total.....	232,500	4,014,000
Lumber and timber .....	172,000	3,450,000			

## E 12.

### IMPROVEMENT OF HUDSON RIVER, NEW YORK.

#### OPERATIONS DURING THE PAST FISCAL YEAR.

Under contract with The Newburgh Dredging Company, dated September 26, 1905, work was continued, and dredging was completed

December 1, 1906. One hundred and seventy-one thousand and nine cubic yards were removed from the various bars and shoals at a cost of 22½ cents per cubic yard, or \$38,477.03.

The following table shows the widths and depths of the deepest navigable channel, through bars and shoals, between Coxsackie and the State Dam at Troy, N. Y., at the end of the fiscal year, so far as developed by soundings since the opening of navigation, and for the previous year for comparison:

Locality.	1906.		1907.	
	Width.	Depth.	Width.	Depth.
	<i>Feet.</i>	<i>Feet.</i>	<i>Feet.</i>	<i>Feet.</i>
Coxsackie shoal.....	180	11.5	100	11.5
Coxsackie light to Stuyvesant light.....	400	12.0	400	12.0
Stonehouse bar.....	340	12.0	50	12.0
Willow Island shoal.....	400	12.0	500	12.0
Coeymans Cross-over.....	350	12.0	810	12.0
Roah Hook to North Coeymans.....	150	11.5	850	12.0
Mulls Cross-over.....	90	12.0	150	12.0
Nine Mile Tree Cross-over.....	70	12.0	120	11.5
Castleton bar.....	50	12.0	80	12.0
Cedar Hill bar.....	180	11.0	200	11.5
Winnies bar.....	240	12.0	250	12.0
Stonelight shoal.....	100	11.5	100	12.0
Bacon Island shoal.....	550	12.0	250	12.0
Bogart Light shoal.....	50	12.0	250	12.0
Douws Point Cross-over.....	190	12.0	120	12.0
Cuyler bar.....	170	11.5	180	12.0
Passenger bridge:				
East draw.....	20	12.0	75	11.5
West draw.....	100	12.0	100	12.0
West fixed span.....				
Freight bridge:				
West draw.....	90	12.0	100	12.0
East draw.....	90	12.0	70	12.0
East fixed span.....	140	12.0	120	10.5
Bath Cross-over.....	175	12.0	150	11.0
Bath shoal.....	250	12.0	250	12.0
Kellogg shoal.....	50	11.5	170	12.0
Fishhouse shoal.....	200	12.0	200	12.0
Round shoal.....	150	11.5	140	11.0
Covills Folly.....	170	12.0	100	12.0
Opposite Breaker Island.....	200	12.0	200	12.0
Van Buren bar.....	50	12.0	120	12.0
Washington bar.....	210	12.0	200	12.0
Front of Watervliet Arsenal.....	220	12.0	250	12.0
Arsenal to Congress Street, Troy, N. Y.....	350	12.0	810	12.0
Congress Street Bridge:				
East draw.....	70	12.0	100	12.0
East fixed span.....	180	12.0	180	12.0
Congress street—Broadway.....	200	12.0	400	12.0
Broadway—Delaware and Hudson bridge.....	100	12.0	120	12.0
Delaware and Hudson bridge:				
Draw span.....	80	12.0	40	11.0
East fixed span.....	100	12.0	80	12.0
To Hoosick street.....	80	11.0	80	10.0
Hoosick street to Boutwell's mill.....	100	12.0	80	12.0
Boutwell's mill to Middleburgh street.....	75	8.0	40	8.5
Entrance to sloop lock.....	20	4.5	20	4.5

The above depths refer to the plane of mean low water established in 1876, except between the Delaware and Hudson Company's bridge and the State Dam at Troy, N. Y., where the plane established by the tide records of 1899, after the dredging below that bridge had been nearly completed, is used.

Under agreement with the Hudson River Dock and Dredging Company, dated April 18, 1907, for dredging between Roah Hook and North Coeymans, completed June 15, 1907, 8,985 cubic yards were removed, at 24½ cents per cubic yard, \$2,235.02.

Under contract with William D. Fuller, dated July 17, 1906, for furnishing rubblestone and quarry spalls—

752 cubic yards of rubblestone, at \$1.24.....	\$932. 48
4,657 cubic yards of quarry spalls, at \$1.19.....	5, 541. 83
Total.....	6, 474. 31

have been delivered in dikes.

Under contracts with C. F. Suderly Sons, dated June 12, 1906, and March 28, 1907, for furnishing piling and round timber for dike work, the following quantities have been delivered:

27,648 linear feet, at 10 cents per linear foot.....	\$2, 764. 80
27,384 linear feet, at 12 cents per linear foot.....	3, 286. 08
Total.....	6, 050. 88

Under contract with Sherman, Brown, Clements Company, dated June 27, 1906, for furnishing tie-rods, bolts, spikes, etc., for dike work, the following material was received:

45,243 pounds, at \$0.026 per pound.....	\$1, 176. 32
--	--------------

Under open-market agreement with Robert R. Sizer & Co., dated May 25, 1906, for furnishing square timber, the following material was received:

96,588 feet B. M. of yellow pine square timber, at \$37 per M.....	\$3, 573. 76
--	--------------

Under open-market agreement with Dexter Hunter for furnishing square timber for dike work, the following material was received:

2,532 feet B. M. yellow pine, at \$37.50 per M.....	\$94. 95
4,206 feet B. M. yellow pine, at \$45 per M.....	189. 18
Total.....	284. 13

Under contract with G. Elias & Bro., dated March 28, 1907, for furnishing square timber for dike work, the following material was received:

39,732 feet B. M. of yellow pine square timber, at \$31.95 per M feet B. M. \$1,269.44	
--	--

Under open-market agreement with Welsh & Grey, dated May 22, 1906, for furnishing hemlock lumber for dike work, the following material was received:

49,682 feet B. M., at \$22.90 per M.....	\$1, 137. 72
59,333 feet B. M., at \$23.90 per M.....	1, 418. 05
109,775 feet B. M., at \$25.30 per M.....	2, 777. 30
54,377 feet B. M., at \$28.30 per M.....	1, 538. 87
Total.....	6, 871. 00

Under contract with Welsh & Grey, dated April 1, 1907, for furnishing hemlock lumber for dike work, the following material was received:

97,045 feet B. M., at \$22.90 per M.....	\$2, 222. 33
28,000 feet B. M., at \$23.90 per M.....	669. 20
19,167 feet B. M., at \$25.30 per M.....	484. 93
4,767 feet B. M., at \$28.30 per M.....	134. 91
Total.....	3, 511. 37

Under contract with Flagler & Vedder, dated March 28, 1907, for furnishing paving stones for dikes at Albany, N. Y., the following material has been received:

595.8 cubic yards, at \$2.20 per cubic yard.....	\$1, 310. 76
--	--------------



Under contract with G. & W. Manufacturing Company, dated March 30, 1907, for furnishing tie-rods, bolts, spikes, etc., for dike work, the following material has been received:

31,282 pounds of iron, at \$0.0274 per pound..... \$857. 13

Under open-market agreement with Kinum & Decklemeyer for furnishing paving stone for dikes, the following material was received:

91.6 cubic yards, at \$1.60 per cubic yard..... \$146. 56

Under open-market agreement with Ulster Davis for transferring paving stone from place of delivery in Albany to dikes, the following material was received:

595.8 cubic yards of paving stone, at \$0.25 per cubic yard..... \$204. 38

Under agreement with Hawley Miller for delivery of dredged material for filling Bath Cross-over dike, the following material was delivered:

3,910 cubic yards, at 12 cents per cubic yard..... \$469. 20

Under agreement with Randerson & Miller, dated June 3, 1906, for furnishing dredge with three scows and tug for removal of obstruction in the channel at Matthews Point, the obstruction was removed at a cost of \$584.

A pile driver, with air compressor, was purchased for use in constructing and repairing dikes, at a cost of \$3,000, and has been employed in construction of Bath Cross-over dike, and repairs and raising of crest of Overslaugh Dike No. 2.

Hired labor was employed with pile driver in constructing Bath Cross-over sheet-pile dike, at a total cost of \$3,545.22.

The following is an approximate cost of putting material in place in the dike:

18,256 linear feet of round piling, at \$0.036.....	\$657. 40
972 linear feet of round timber, at \$0.005.....	4. 86
27,631 feet B. M. of square timber, at \$25 per M feet B. M.....	690. 77
16,708 pounds of tie-rods and screw bolts, at \$0.035 per pound.....	584. 78
5,663 pounds of driftbolts, spikes, and washers, at \$0.004 per pound.....	22. 65
171,695 feet B. M. of sheet piling driven, at \$9.23 per M feet B. M.....	1, 584. 76

Total..... 3, 545. 22

Hired labor was employed with pile driver in repairing and raising the crest of the Overslaugh Dike No. 2, at a cost of \$5,546.11.

The following is the approximate cost of putting the material in place and securing it, and making the necessary excavation for putting in the sills for platforms, etc.:

6,443 linear feet of round piling, at 12 cents per linear foot.....	\$773. 16
13,668 feet B. M. of timber in sills, at \$22 per M feet B. M.....	300. 70
16,104 feet B. M. of timber in walling, at \$17 per M feet B. M.....	273. 77
19,492 feet B. M. of lumber in floor, at \$8 per M feet B. M.....	155. 94
2,166 pounds of screw bolts, at \$0.004 per pound.....	8. 66
1,150 pounds of driftbolts, washers, and nails, at \$0.004 per pound.....	4. 60
1,027 square yards of paving relaid, at \$1.35 per square yard.....	1, 386. 45
Grading for paving relaid.....	1, 027. 00
Removing old paving and rubblestone, and excavating for platforms.....	1, 615. 83

Total..... 5, 546. 11

A survey, having in view the establishment of pier and bulkhead lines at Hastings-on-Hudson, was made in September, 1906, and

public hearings as to the proposed lines held on January 24, February 11 and 15, 1907. The harbor lines agreed upon were approved by the Secretary of War on April 5, 1907.

*Money statement.*

July 1, 1906, balance unexpended	\$167,908.33
Amount appropriated by river and harbor act approved March 2, 1907	250,000.00
Receipts from sales	13.75
	<hr/>
	417,917.08
June 30, 1907, amount expended during fiscal year:	
For works of improvement	\$96,546.20
For maintenance of improvement	18,127.19
	<hr/>
	114,673.39
July 1, 1907, balance unexpended	303,243.69
July 1, 1907, outstanding liabilities	11,276.73
	<hr/>
July 1, 1907, balance available	291,966.96
	<hr/>
July 1, 1907, amount covered by uncompleted contracts	26,858.64
Amount (estimated) required for completion of existing project	858,037.64
	<hr/>
Amount that can be profitably expended in fiscal year ending June 30, 1909, in addition to the balance unexpended July 1, 1907:	
For works of improvement	\$400,000.00
For maintenance of improvement	70,000.00
	<hr/>
	470,000.00
Submitted in compliance with requirements of sundry civil act of June 4, 1897, and of section 7 of the river and harbor act of 1899.	

### APPROPRIATIONS.

**For previous projects:**

July 30, 1834	\$70,000.00
July 2, 1836	100,000.00
March 3, 1837	100,000.00
July 7, 1838	100,000.00
August 30, 1852	50,000.00
June 26, 1864 (allotment)	33,000.00
June 23, 1866	50,000.00
March 3, 1867	305,188.00
July 25, 1868 (allotment)	85,000.00
April 10, 1869 (allotment)	89,100.00
July 11, 1870	40,000.00
March 3, 1871	40,000.00
June 10, 1872	40,000.00
March 3, 1873	40,000.00
June 23, 1874	40,000.00
March 3, 1875	40,000.00
August 14, 1876	50,000.00
June 18, 1878	70,000.00
March 3, 1879	30,000.00
June 14, 1880	20,000.00
March 3, 1881	15,000.00
August 2, 1882	10,000.00
July 5, 1884	30,000.00
August 5, 1886	26,250.00
August 11, 1888	75,000.00
September 19, 1890	119,400.00
	<hr/> \$1,667,938.00

## For present project:

September 19, 1890 (balance)-----	\$30,600.00
July 13, 1892-----	187,500.00
March 3, 1893-----	500,000.00
August 18, 1894-----	145,000.00
March 3, 1895-----	500,000.00
June 11, 1896-----	480,000.00
June 4, 1897-----	475,000.00
July 1, 1898-----	160,406.56
March 3, 1899-----	100,000.00
June 6, 1900-----	400,000.00
March 3, 1901-----	100,000.00
June 13, 1902-----	225,000.00
March 3, 1905-----	203,300.00
March 2, 1907-----	250,000.00
	<hr/>
	\$3,753,806.56
Total-----	5,424,744.56
January 11, 1901 (repayment to appropriation)-----	5.40
June 30, 1907 (received from sales)-----	13.75

## CONTRACTS IN FORCE.

Name of contractor: The Newburgh Dredging Company.

Date of contract: September 26, 1905.

Date of approval: October 14, 1905.

Date of commencement: November 17, 1905.

Date of completion: Time limit waived.

Work to be done: Dredging 280,000 cubic yards in Hudson River, at 22½ cents.

Amount to be expended: On general improvement, \$50,500; on Stonehouse bar, \$12,500.

Name of contractor: C. F. Suderley Sons.

Date of contract: June 12, 1906.

Date of approval: June 27, 1906.

Date of commencement: July 27, 1906.

Date of completion: August 27, 1906.

Work to be done: Delivering 1,516 pieces of round timber and piling.

Amount to be expended: \$2,764.

Name of contractor: Sherman, Brown, Clements Company.

Date of contract: June 27, 1906.

Date of approval: July 3, 1906.

Date of commencement: September 7, 1906.

Date of completion: October 7, 1906.

Work to be done: Furnishing and delivering tie-rods, bolts, spikes, etc., for constructing and repairing dikes, at 2½ cents per pound.

Amount to be expended: \$1,179.

Name of contractor: William D. Fuller.

Date of contract: July 17, 1906.

Date of approval: August 16, 1906.

Date of commencement: October 18, 1906.

Date of completion: Time limit waived.

Work to be done: Furnishing and delivering about 3,000 cubic yards of rubble stone, at \$1.24 per cubic yard, and about 5,000 cubic yards of quarry spalls, at \$1.19 per cubic yard.

Amount to be expended: \$9,670.

Name of contractor: C. F. Suderley Sons.

Date of contract: March 20, 1907.

Date of approval: April 4, 1907.

Date of commencement: June 8, 1907.

Date of completion: August 8, 1907.

Work to be done: Furnishing 27,384 linear feet piling and round timber, at 12 cents per linear foot.

Amount to be expended: \$3,286.08.

# 1012 REPORT OF THE CHIEF OF ENGINEERS, U. S. ARMY.

Name of contractor: G. Elias & Bro.  
 Date of contract: March 28, 1907.  
 Date of approval: April 11, 1907.  
 Date of commencement: June 19, 1907.  
 Date of completion: August 19, 1907.  
 Work to be done: Furnishing square timber.  
 Amount to be expended: \$2,814.16.

Name of contractor: Flagler & Vedder.  
 Date of contract: March 29, 1907.  
 Date of approval: April 4, 1907.  
 Date of commencement: June 8, 1907.  
 Date of completion: November 8, 1907.

Work to be done: Furnishing 10,000 cubic yards paving stone at \$2.20 per cubic yard.

Amount to be expended: \$22,000.

Name of contractor: G. & W. Manufacturing Company.  
 Date of contract: March 30, 1907.  
 Date of approval: April 8, 1907.  
 Date of commencement: June 9, 1907.  
 Date of completion: August 9, 1907.  
 Work to be done: Furnishing tie-rods, bolts, spikes, etc.  
 Amount to be expended: \$2,726.30.

Name of contractor: Welsh & Grey.  
 Date of contract: April 1, 1907.  
 Date of approval: April 10, 1907.  
 Date of commencement: June 11, 1907.  
 Date of completion: August 11, 1907.  
 Work to be done: Furnishing square timber and lumber.  
 Amount to be expended: \$3,571.41.

## COMMERCIAL STATISTICS.

*Commerce within the limits of the improvement during the season of 1906.*

Articles.	Tonnage.	Value.	Articles.	Tonnage.	Value.
Brick .....	111,565	\$294,141.43	Ice .....	788,464	\$1,895,207.00
Lumber and timber .....	547,709	8,556,399.28	Stone, cement, sand, etc. ....	418,570	1,332,432.00
Pulp wood and wood pulp .....	2,085	40,714.00	Fuel (wood and coal) .....	409,823	1,823,127.44
Vegetable food .....	352,989	10,401,342.00	Ore .....	69,866	235,703.00
Hay .....	49,707	854,708.00	Sundries .....	151,548	16,098,307.76
Manufactures .....	113,132	1,427,711.00			
General merchandise .....	314,952	32,704,955.00	Total .....	3,325,360	75,664,747.91

Number of passengers carried, 1,300,297.

## E 13.

### IMPROVEMENT OF HARBOR AT SAUGERTIES, NEW YORK.

#### OPERATIONS DURING THE PAST FISCAL YEAR.

Under contract with Hawley Miller dated July 17, 1906, dredging was commenced August 14, 1906, and completed September 27, 1906. Twenty-five thousand five hundred and forty-five cubic yards of material were removed, resulting in a channel 12 feet deep at mean low water, and 75 feet wide, from the entrance to steamboat landing, except at a ledge of rock where the depth is only 10 feet and the width about 50 feet.

*Money statement.*

July 1, 1906, balance unexpended.....	\$4,567.08
Amount appropriated by river and harbor act approved March 2, 1907.....	20,000.00
	<u>24,567.08</u>
June 30, 1907, amount expended during fiscal year:	
For works of improvement.....	\$3,162.55
For maintenance of improvement.....	963.92
	<u>4,126.47</u>
July 1, 1907, balance unexpended.....	20,440.61
Amount (estimated) required for completion of existing project.....	<u>15,749.99</u>
{ Amount that can be profitably expended in fiscal year ending June 30, 1909, in addition to the balance unexpended July 1, 1907:	
For works of improvement.....	\$15,749.99
For maintenance of improvement.....	5,000.00
	<u>20,749.99</u>
Submitted in compliance with requirements of sundry civil act of June 4, 1897, and of section 7 of the river and harbor act of 1899.	

## APPROPRIATIONS.

For first project:	
July 5, 1885.....	\$5,000
August 5, 1886.....	15,000
August 11, 1888.....	12,000
September 19, 1890.....	10,000
July 13, 1892.....	5,000
August 18, 1894.....	5,000
June 3, 1896.....	2,500
March 3, 1899.....	2,500
	<u>\$57,000</u>
For present project:	
June 13, 1902.....	20,000
June 13, 1902 (allotment—emergency).....	3,000
March 3, 1905.....	5,000
March 2, 1907.....	20,000
	<u>48,000</u>
Total.....	<u>105,000</u>

## CONTRACT IN FORCE.

Name of contractor: Hawley Miller.

Date of contract: July 17, 1906.

Date of approval: July 27, 1906.

Date of commencement: August 28, 1906.

Date of completion: November 30, 1906.

For dredging 27,120 cubic yards of material at 14½ cents per cubic yard, scow measurement.

## COMMERCIAL STATISTICS, 1906.

Articles.	Estimated tonnage.	Estimated value.	Articles.	Estimated tonnage.	Estimated value.
General merchandise.....	1,000	\$80,000	Hay.....	1,000	\$15,000
Coal and other fuel.....	5,000	20,000	Fruit and farm products.....	800	12,000
Brick.....	1,200	7,200	Manufactures.....	10,000	1,000,000
Stone, cement, sand, etc..	80,000	500,000	Total.....	<u>83,800</u>	<u>1,606,200</u>
Ice.....	8,000	6,000			
Lumber and timber.....	1,500	16,000			

## E 14.

## IMPROVEMENT OF HARBORS AT RONDOUT AND PEEKSKILL, NEW YORK.

## (A) RONDOUT HARBOR.

## OPERATIONS DURING THE PAST FISCAL YEAR.

None. A survey and report showing the condition of the channel and dikes is to be made before advertising for proposals for redredging and repairs.

*Money statement.*

July 1, 1906, balance unexpended.....	\$9,797. 19
Amount appropriated by river and harbor act approved March 2, 1907..	3,000. 00
	<hr/> 12,797. 19
June 30, 1907, amount expended during fiscal year, for maintenance of improvement.....	673. 77
	<hr/> 12,123. 42
<hr/>	
{ Amount that can be profitably expended in fiscal year ending June 30, 1909, for maintenance of improvement, in addition to the balance unexpended July 1, 1907.....	
Submitted in compliance with requirements of sundry civil act of June 4, 1897, and of section 7 of the river and harbor act of 1899.	
	3,000. 00

## APPROPRIATIONS.

June 10, 1872 .....	\$10,000	July 13, 1892.....	\$5,000
March 3, 1873.....	20,000	August 18, 1894 .....	5,000
June 8, 1875 (allotment).....	1,000	June 3, 1896 .....	2,500
August 14, 1876 .....	30,000	June 13, 1902 (allotment).....	2,500
June 15, 1878 .....	30,000	June 13, 1902 (allotment).....	3,800
August 2, 1882 .....	2,000	March 3, 1905 (allotment).....	15,000
July 5, 1884 .....	1,000	March 2, 1907 (allotment).....	3,000
August 5, 1886 .....	2,500		
August 11, 1888 .....	5,000	Total .....	143,300
September 19, 1890 .....	5,000		

## COMMERCIAL STATISTICS FOR 1906.

Articles.	Tons.	Value.	Articles.	Tons.	Value.
General merchandise.....	10,586	\$317,580	Lumber and timber.....	50,000	\$1,800,000
Sundries.....	100,000	700,000	Fruits and farm products..	5,881	117,620
Brick .....	200,000	1,000,000	Manufactures.....	7,067	705,700
Stone, cement, sand, etc ..	500,000	1,500,000			
Ice.....	125,000	300,000	Total .....	998,524	5,640,900

## (B) PEEKSKILL HARBOR.

## OPERATIONS DURING THE PAST FISCAL YEAR.

Under contract with Du Bois Brothers Dredging Company, dated February 27, 1907, dredging was commenced April 3, 1907, and com-

pleted April 15, 1907; 7,812.8 cubic yards were removed under the contract, restoring part of the dredged channel to its projected width and depth.

*Money statement.*

July 1, 1906, balance unexpended.....	\$2, 407. 57
Amount appropriated by river and harbor act approved March 2, 1907.....	3, 000. 00
	<hr/> 5, 407. 57
June 30, 1907, amount expended during fiscal year, for maintenance of improvement.....	2, 095. 29
	<hr/> 3, 312. 28
July 1, 1907, balance unexpended.....	
<hr/>	
{ Amount that can be profitably expended in fiscal year ending June 30, 1909, for maintenance of improvement, in addition to the balance unexpended July 1, 1907.....	3, 000. 00
{ Submitted in compliance with requirements of sundry civil act of June 4, 1897, and of section 7 of the river and harbor act of 1899.	

APPROPRIATIONS.

June 3, 1896.....	\$10, 000
March 3, 1899.....	10, 000
June 13, 1902 (allotment).....	3, 000
March 3, 1905 (allotment).....	2, 500
March 2, 1907 (allotment).....	3, 000
	<hr/>
Total.....	28, 500

CONTRACT IN FORCE.

Name of contractor: Du Bois Brothers Dredging Company.

Date of contract: February 27, 1907.

Date of approval: March 4, 1907.

Date of commencement: March 6, 1907.

Date of completion: May 6, 1907.

For dredging 9,000 cubic yards of material at 20 cents per cubic yard, scow measurement.

COMMERCIAL STATISTICS.

Articles.	Tons.	Value.	Articles.	Tons.	Value.
General merchandise.....	14, 040	\$231, 000	Hay and straw.....	50	\$800
Iron.....	5, 800	120, 800	Grain, flour, and feed.....	2, 120	46, 000
Coal.....	56, 581	224, 884	Emery.....	333	1, 665
Brick.....	8, 507	13, 246	Clay, pottery, etc.....	1, 618	5, 000
Building stone.....	175	525	Broken stone.....	4, 130	4, 130
Cement, lime, and sand.....	3, 896	7, 314			
Lumber.....	300	5, 000	Total.....	88, 550	659, 864

## E 15.

## IMPROVEMENT OF WAPPINGER CREEK, NEW YORK.

## OPERATIONS DURING THE PAST FISCAL YEAR.

None. The New York Central and Hudson River Railroad Company is about to build a new draw a short distance south of the present one, and connect the new location with the channel improved by the United States by dredging to the projected depth of 8 feet at mean low water. It is not contemplated to expend the appropriation of March 2, 1907, until after the above work has been completed.

*Money statement.*

July 1, 1906, balance unexpended.....	\$129. 83
Amount appropriated by river and harbor act approved March 2, 1907.....	3, 000. 00
	<hr/> 3, 129. 83
June 30, 1907, amount expended during fiscal year, for maintenance of improvement.....	129. 83
	<hr/> 3, 000. 00
July 1, 1907, balance unexpended.....	3, 000. 00
<hr/>	
{ Amount that can be profitably expended in fiscal year ending June 30, 1909, for maintenance of improvement, in addition to the balance unexpended July 1, 1907.....	3, 000. 00
{ Submitted in compliance with requirements of sundry civil act of June 4, 1897, and of section 7 of the river and harbor act of 1899.	

## APPROPRIATIONS.

September 19, 1890.....	\$13, 000
June 13, 1902.....	1, 500
March 3, 1905.....	3, 000
March 2, 1907.....	3, 000
Total.....	<hr/> 20, 500

## COMMERCIAL STATISTICS.

*Vessels employed in trade in 1906.*

Class.	Trips made.	Tonnage.	Draft.
Steamers.....	2, 148	21-37	Feet. 4-4½
Barges, etc.....	273	250-500	6-8½

*Freight handled.*

Articles.	Tons.	Value.	Articles.	Tons.	Value.
General merchandise.....	8, 885	\$360, 400	Grain, flour, and feed.....	263	\$6, 500
Iron.....	845	5, 600	Fruits and farm products..	40	4, 000
Coal and other fuel.....	27, 900	158, 500	Ice.....	5	15
Cement, lime, and sand....	8, 155	10, 745	Sulphur.....	358	1, 744
Building stone.....	45	135	Petroleum.....	2	60
Lumber and timber.....	190	24, 600	Total.....	46, 194	572, 399
Hay and straw.....	6	100			



## E 16.

## IMPROVEMENT OF TARRYTOWN HARBOR, NEW YORK.

## OPERATIONS DURING THE PAST FISCAL YEAR.

Under contract with Columbia Dredging Company, dated December 13, 1905, the work of dredging a channel from deep water in Hudson River to the wharfs in Tarrytown, commenced April 17, 1906, was completed August 7, 1906. A total of 54,478 cubic yards of material was removed under the contract, resulting in a channel of the dimensions given in the summary, page 143.

Under contract with Du Bois Brothers Dredging Company, dated June 15, 1907, for dredging, work had not been commenced at the close of the fiscal year.

The estimate for completion has been increased to \$35,491.68, for reasons given in the summary.

*Money statement.*

July 1, 1906, balance unexpended.....	\$4,200. 61
Amount appropriated by river and harbor act approved March 2, 1907.....	16,000. 00
	<hr/>
June 30, 1907, amount expended during fiscal year, for works of improvement.....	20,200. 61
	4,200. 61
July 1, 1907, balance unexpended.....	<hr/>
July 1, 1907, outstanding liabilities.....	16,000. 00
	90. 00
July 1, 1907, balance available.....	<hr/>
	15,910. 00
Amount (estimated) required for completion of existing project.....	<hr/>
	9,491. 68
<hr/>	
{ Amount that can be profitably expended in fiscal year ending June 30, 1909, in addition to the balance unexpended July 1, 1907:	
For works of improvement.....	\$9,491. 68
For maintenance of improvement.....	3,000. 00
	<hr/>
	12,491. 68
{ Submitted in compliance with requirements of sundry civil act of June 4, 1897, and of section 7 of the river and harbor act of 1899.	

## APPROPRIATIONS.

March 3, 1906.....	\$10,000
March 2, 1907.....	16,000
	<hr/>
Total .....	26,000

## CONTRACTS IN FORCE.

Name of contractor: Columbia Dredging Company.

Date of contract: December 13, 1905.

Date of approval: January 3, 1906.

Date of commencement: March 1, 1906.

Date of completion: Time limit waived.

For dredging 54,150 cubic yards of material, at 15.7 cents per cubic yard, scow measurement.

# 1018 REPORT OF THE CHIEF OF ENGINEERS, U. S. ARMY.

Name of contractor : Du Bois Brothers Dredging Company.

Date of contract : June 15, 1907.

Date of approval : June 27, 1907.

Date of commencement : July 29, 1907.

Date of completion : November 29, 1907.

For dredging and removal of bowlders to the extent of \$13,000. Dredging at 13½ cents per cubic yard, scow measurment, and bowlders, at \$4 per cubic yard, solid measurement.

## COMMERCIAL STATISTICS.

### *Vessels employed in trade in 1906.*

Class.	Trips made.	Tonnage.	Draft.
Steamers .....	24	62	Feet. 7
Barges, etc .....	140	250-495	6-7

Passengers carried, 50,000.

### *Freight handled.*

Articles.	Tons.	Value.	Articles.	Tons.	Value.
Coal and other fuel.....	56,164	\$286,669	Broken stone .....	12,000	\$12,000
Brick .....	2,660	13,210	Gravel .....	1,200	1,200
Cement, lime, and sand....	3,240	11,400	Petroleum .....	950	23,000
Lumber and timber .....	1,750	25,000	Ashes, garbage, etc .....	600	.....
Clay, pottery, etc.....	250	5,000	Total.....	79,714	384,979
Paving blocks.....	900	2,500			

## E 17.

### IMPROVEMENT OF CONEY ISLAND CHANNEL, NEW YORK HARBOR.

#### OPERATIONS DURING THE PAST FISCAL YEAR.

Proposals for dredging were invited by advertisement June 10, 1907, bids to be opened July 10, 1907.

#### *Money statement.*

Amount appropriated by river and harbor act approved March 2, 1907.....	\$188,300.00
June 30, 1907, amount expended during fiscal year, for works of improvement.....	15.05
July 1, 1907, balance unexpended.....	188,284.95

#### APPROPRIATION.

March 2, 1907.....	\$188,300
--------------------	-----------

## E 18.

## REMOVING SUNKEN VESSELS OR CRAFT OBSTRUCTING OR ENDANGERING NAVIGATION.

(a) *Wreck of unknown sloop in Great South Bay, Long Island, New York.*—On June 12, 1906, a sunken sloop was reported to this office as endangering navigation in Great South Bay, about 1 mile south-southeast from Sampawams Point.

The wreck was examined on June 26, 1906. The owner of the sloop could not be found. Removal was recommended to the Department on June 29, 1906, and an allotment of \$375 for this purpose was made July 2, 1906.

Proposals for removing the obstruction were invited by written notice July 7, 1906, and again on August 21, 1906. No bids were received in answer to the first notice, and only two were received as a result of the second notice, the lowest being for \$495, which was rejected as excessive.

On September 10, 1906, authority was requested to remove the wreck by the purchase of material and the hire of labor in the open market, which request was granted on September 12, 1906. The work of removal was commenced October 10, 1906, and was completed October 15, 1906, at a total cost of \$375. Final report was submitted October 24, 1906.

(b) *Wreck of schooner Eaglet, in Hudson River, New York, N. Y.*—On July 10, 1906, the *Eaglet* was reported to this office as obstructing and endangering navigation in Hudson River, and an examination of the wreck was made the same day. The site of the wreck was buoyed by the Light-House Establishment July 12, 1906, and the owner abandoned the vessel on July 26, 1906. Recommendation to the Department for its removal by the United States was made on the same day, and an allotment of \$1,000 for this purpose was made July 30, 1906.

Proposals for removing the obstruction were invited by written notice August 1, 1906, bids to be opened August 11, 1906. Two bids were received, the lowest of which was \$755, the wreck to become the property of the contractor.

Removal was completed August 29, 1907, at a total cost of \$806.37. Final report was submitted September 4, 1906.

(c) *Pieces of wreckage of tugboat Sharp and barge Coggeswell in Hudson River, New York.*—Tugboat *Sharp* was burned and barge *Coggeswell* was sunk in Hudson River in 1902. Both boats disappeared during the spring freshets. On July 22, 1906, some damage was done to propellers on boats navigating the Overslaugh, and on July 23, 1906, two pieces of wreckage, which were identified as parts of the missing boats, were grappled and removed. The cost of removal was \$125, which amount was allotted by the Department July 31, 1906. Final report was submitted July 28, 1906.

(d) *Wreck of unknown pile driver in East River, New York, N. Y.*—On August 1, 1905, this office was notified that a pile driver, lying sunk in East River, off pier 3, on July 30, 1905, had been abandoned by the owner.

The site of the wreck was marked by a H. S. first-class tall-type can buoy by the Light-House Establishment, and immediate steps were taken to cause its removal.

Agreement was entered into August 4, 1905, with the Merritt & Chapman Derrick and Wrecking Company, to do the work for \$350, but though the locality was carefully examined by the wrecking company under the direction of a representative from the office, no trace of the obstruction could be found.

The wreck was reported to the Department July 19, 1906, and an allotment of \$100 was made August 4, 1906, to defray the actual and necessary expenses incidental to its removal.

(e) *Wreck of canal boat Thomas Tryon in Hempstead Harbor, Long Island, N. Y.*—This boat was sunk on May 24, 1906, in the mouth of Glen Cove Creek, Hempstead Harbor, while en route to New York City from Sea Cliff, L. I., with a load of fire sand.

It was examined on July 17, 1906, and the supposed owners were communicated with from time to time thereafter, with a view of having them remove it. The owners could not, however, be definitely located, and proposals for removing the obstruction were accordingly invited by written notice, dated October 2, 1906, bids to be opened November 1, 1906. Three bids were received for \$800, \$475, and \$50. Award was made to the lowest bidder, who failed to fulfill his agreement. As the next lowest bid, \$475, was considered excessive, arrangements were made for removing the wreck by the purchase of material and the hire of labor in the open market.

Report was made to the Department November 1, 1906, and allotments of funds for the purpose of removing the obstruction were made on November 6, 1906, of \$200, and on December 18, 1906, of \$200, a total of \$400.

The work of removal was commenced December 8, 1906, and was completed December 24, 1906, at a total cost of \$400. Final report was submitted January 3, 1907.

(f) *Wreck of canal boat Malvina St. Clair in East River, New York.*—On November 1, 1906, this office was notified that a derelict had been picked up in East River, off Seventy-second street, Manhattan, New York, and towed to the foot of East Twenty-third street.

From an examination made on the same day it was evident that the boat was abandoned, and, being of no value, arrangements were made with the Baxter Wrecking Company, to remove it to that company's property at Weehawken, N. J., for the sum of \$175, the boat to become the property of the wrecking company. Removal was completed November 3, 1906, at a total cost of \$190.

Report was submitted to the Department November 12, 1906, and an allotment of \$190 was made November 14, 1906, to pay the cost of removal.

(g) *Wreck of steamer Governor in Rockaway Inlet, Long Island, New York.*—On September 4, 1906, the attention of this office was called to the existence of a submerged wreck in Rockaway Inlet, endangering navigation in that vicinity.

When examined September 8, 1906, the wreck was supposed to be the remains of oyster dredge *Boyle*, which sank about seven years ago during a storm, and had since been buried in the sand bars which

form at the entrance to Jamaica Bay. The shifting of these bars uncovered the wreckage, so that, when examined, the hull was lying in 10 to 12 feet of water at low water and seriously endangered navigation.

Proposals for removal were accordingly invited October 2, 1906, bids to be opened October 12, 1906. The only bid received was for \$4,250.

After opening the bids it was learned that the wreck was probably that of steamer *Governor*, a much larger boat than the *Boyle*.

It was therefore deemed advisable to invite proposals for the removal of the *Governor* under formal contract. This was accordingly done by advertisement, dated December 12, 1906, bids to be opened January 11, 1907. Three bids were received, the lowest being for \$1,545.

Removal was completed February 23, 1907, at a total cost of \$1,625. Final report was submitted February 26, 1907.

(h) *Wreck of barge Charles G. Hill, in Hudson River, New York.*—On December 5, 1906, the attention of this office was called to the sinking of this barge in Hudson River, opposite Marlboro, N. Y.

From examinations made on December 6 and 7, 1906, it was learned that the boat was loaded with brick and sank in about 50 feet of water, approximately 1,200 feet east of Young's dock in Marlboro. The mast projected several feet above the water and constituted a serious menace to navigation.

The owner of the boat was, on December 8, 1906, requested to remove the obstruction. No reply having been received to this request, arrangements were made on December 13, 1906, for the removal of all parts of the wreck lying above the hull of the vessel, the recovered wreckage to be the property of the United States.

Removal was completed December 14, 1906, at a total cost of \$121.90. Report was submitted to the Department December 17, 1906, and an allotment of this amount to pay the cost of removal was made December 21, 1906.

Subsequently, on December 31, 1906, the wreckage was advertised for sale, bids to be opened January 10, 1907. The only bid received was for \$15, and this amount was forwarded to the United States Treasury January 17, 1907.

(i) *Wreck of tugboat Sea Wall, in Harlem River, New York.*—On December 18, 1906, the department of docks and ferries of the city of New York reported tugboat *Sea Wall* sunken in Harlem River, New York, near the foot of One hundred and twenty-ninth street, Manhattan.

When examined December 15, 1906, it was lying in from 8 to 12 feet of water outside of the harbor lines established by the United States and constituted an obstruction to navigation.

The owner abandoned the boat December 21, 1906, and proposals for its removal were accordingly invited December 27, 1906, bids to be opened January 7, 1907, all wreckage to become the property of the successful bidder. Award was made to the lowest bidder, who offered to do the work for \$10.

Report was submitted to the Department January 9, 1907, and an allotment of \$160 for examining and removing the obstruction and for paying all expenses incident thereto was made January 11, 1907.

Removal was completed January 14, 1907, at a total cost of \$63.70. Final report was submitted January 18, 1907.

(j) *Wreck of ferryboat Paterson in Hudson River, New York.*—This ferryboat, owned by the Erie Railroad Company, was sunk in Hudson River December 29, 1906, in about 65 feet of water, about opposite and 1,000 feet distant from pier 47, North River, Manhattan.

On January 9, 1907, this office was informed that the boat had been abandoned, but acknowledgment to this effect was not obtained from the owners until January 25, 1907. In the meantime report was submitted to the Department and an allotment of \$200 was made January 22, 1907, for the purpose of making an examination with a view of submitting an estimate of the cost of removal.

Proposals for removing the obstruction were invited under written notice, dated January 26, 1907, bids to be opened January 30, 1907. The lowest bid was \$1,720. Contract was entered into January 31, 1907, the contractor being required thereunder to complete the work within thirty days.

Upon the request of the contractor, who rightfully claimed that the work had been delayed by floating ice, the time limit was waived.

The work was examined by sweeping on March 4, 9, 19, and 30, on each of which occasions the contractor claimed to have removed the wreck to the required depth of 43 feet below mean low water. The last examination, made on March 30, 1907, indicated a least depth over the obstruction of about 41 feet.

The contractor claims to have obtained the required depth and a further examination is to be made as soon as it can be done satisfactorily by a diver.

In addition to the allotment of \$200 made January 22, 1907, for making an examination of the wreck, further allotments were made on February 1, 1907, of \$2,500, and on April 3, 1907, of \$500, for removing the obstruction. A total of \$1,371.40 had been expended on this work to June 30, 1907.

(k) *Wreck of canal boat Mamie Doherty, in Hudson River, New York.*—This boat grounded on the channel bank of Hudson River, November 20, 1906, off the mouth of Poesten Kill, Troy, N. Y., and subsequently broke in two and was abandoned by the owners.

As an attempt to remove the obstruction during the winter months would probably be unsuccessful, proposals for the work were not invited until March 23, 1907, bids to be opened April 2, 1907. The lowest bid was for \$785, but the bidder refused to carry out his bid. Proposals were again invited April 9, 1907, bids to be opened April 19, 1907. The lowest bid was for \$950, which was accepted.

Report was submitted to the Department April 20, 1907, and an allotment of \$1,100 for the removal of the wreck was made April 24, 1907. Because of freshets the wreck had not been removed at the close of the fiscal year.

(l) *Wreck of the lighter Hero, in Newtown Creek, New York.*—On June 18, 1907, this office was notified that a lighter had sunk at the junction of Newtown Creek and English Kills and endangered passing vessels.

From an examination of the sunken vessel made on June 19, 1907, it appeared that the wreck was that of lighter *Hero* and constituted a serious obstruction to navigation.

The owner having informed this office that he had abandoned the vessel, and as its immediate removal was necessary to the safety of navigation, proposals were invited verbally for its removal, the wreckage to become the property of the bidder receiving the award. Award was made on June 24, 1907, to the lowest bidder, who proposed to do the work for \$200.

The wreck was reported to the Department June 24, 1907, and an allotment of \$235 was made on June 26, 1907.

The obstruction was reported removed on June 28, 1907, but an inspection to verify the report had not been completed at the close of the fiscal year.

(m) *Wreck of canal boat in entrance to Pugsleys Creek, north of Classons Point, East River, New York.*—On June 10, 1907, this office was notified that navigation in Pugsleys Creek was obstructed by a sunken canal boat, and from an examination made on June 11, 1907, it appeared that the wreck was that of an old canal boat and probably contained some stone ballast. Neither the name of the boat nor that of the owner could be learned.

A firm of contractors reported the impossibility of delivering a considerable quantity of material destined for a point in the creek above the obstruction, and arrangements were therefore made for the immediate removal of the boat by the hire of labor and purchase of material in the open market, but from an examination made June 18, 1907, with this in view, it appeared that the work could not be done economically without special plant. Proposals were accordingly invited by written notice dated June 21, 1907, bids to be opened June 26, 1907, all wreckage to become the property of the successful bidder. Award was made to the lowest bidder, who proposed to do the work for \$594.

An allotment of \$650 to pay the cost of removal and expenses incidental thereto was asked for by telegraph on June 26, 1907, and an allotment of this amount was made the same day.

Work on the wreck was commenced June 28, 1907, but had not been completed at the close of the fiscal year.

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#### CONTRACTS IN FORCE.

##### *Wreck of steamer Governor.*

Name of contractor: Charles W. Johnston.

Date of contract: January 28, 1907.

Date of approval: February 2, 1907.

Date of commencement: March 4, 1907.

Date of completion: July 4, 1907.

For completely removing the wreck of the steamer *Governor* from Rockaway Inlet, for \$1,223.

##### *Wreck of ferryboat Paterson.*

Name of contractor: Eugene Boehm.

Date of contract: January 31, 1907. (Emergency contract.)

Date of commencement: February 1, 1907.

Date of completion: March 3, 1907.

For removing wreck of ferryboat *Paterson* from the Hudson River, the machinery, boiler, and ironwork to a clear depth of 43 feet at mean low water, and the woodwork to be completely removed, for \$1,720.





## APPENDIX F.

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### IMPROVEMENT OF NEW YORK HARBOR AND OF BAY RIDGE AND RED HOOK CHANNELS, NEW YORK; ENLARGEMENT OF GOVERNORS ISLAND, NEW YORK.

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REPORT OF LIEUT. COL. W. L. MARSHALL, CORPS OF ENGINEERS,  
OFFICER IN CHARGE, FOR THE FISCAL YEAR ENDING JUNE  
30, 1907.

#### IMPROVEMENTS.

- |   |  |
|---|--|
| 1. New York Harbor, New York.                           | 4. Removing sunken vessels or craft    |
| 2. Bay Ridge and Red Hook channels,<br>New York Harbor. | obstructing or endangering navigation. |
| 3. Enlargement of Governors Island,<br>New York Harbor. |  |
- 

UNITED STATES ENGINEER OFFICE,  
*New York City, July 9, 1907.*

GENERAL: I have the honor to submit herewith annual report upon works of river and harbor improvement in my charge for the fiscal year ending June 30, 1907.

Very respectfully, your obedient servant,

W. L. MARSHALL,  
*Lieut. Col., Corps of Engineers.*

Brig. Gen. A. MACKENZIE,  
*Chief of Engineers, U. S. A.*

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#### F 1.

#### IMPROVEMENT OF NEW YORK HARBOR, NEW YORK.

The title "Improvement of New York Harbor" has been applied to the improvement of the channels of the main entrance from the sea.

OPERATIONS DURING THE FISCAL YEAR ENDING JUNE 30, 1907.

*Maintenance.*—At the beginning of the year the U. S. dredge *Gedney* was at work upon deepening shoals along the west edge of Main Ship channel near its south end. She continued this work, moving farther north along the channel edge during the year, exca-

vating a total of 93,643 cubic yards of mud. Throughout the entire length of the Main Ship channel, about 5 miles, the currents run cross wise of the channel and carry over the channel edge mud from the shoals on either side. The frequent passing of deep ships prevents this mud settling permanently in the middle of the channel and confines it to the edges, where at present rate it is depositing faster than the *Gedney* can remove it. The available width of the 30-foot channel is generally from 500 to 800 feet.

The *Gedney's* boilers were found to be in bad condition in the fall of 1906, necessitating repairs which by reason of the location of the work, as well as other causes, were exceedingly slow. The *Gedney* stopped work November 30, 1906, and was not in condition to resume until July 1, 1907.

Her working time and lost time during the year were as follows:

	Days.
Actually at work, parts of 102 days, equivalent to-----	84
Work prevented by weather (fog, storm, etc.)-----	25½
General repairs to boilers, and laying up part of the winter-----	177
Minor repairs during work-----	7½
Other causes, coaling, etc-----	11
Sundays and holidays-----	60
Total -----	365

#### AMBROSE CHANNEL.

*Under contract.*—The contractor's dredges *Thomas* and *Mills* continued working on the south half of the channel, between points 9,000 and 16,000 feet from the outer end and in reducing the outer edge of shoal in the north half of the channel, until October. October 1 the *Thomas* was withdrawn, ostensibly for repairs, and October 8 the *Mills* was withdrawn, and notice sent by the owners of the dredges that neither dredge would return to the work. The dredges belonged to the Metropolitan Dredging Company, a company organized for the work under the contract, and in which the contractor himself did not have a controlling interest. The executor of the estate of the contractor (deceased) represented that he expected to be able to get control of the plant and to resume dredging. He was unable to do this, and on December 3, 1906, the contract was annulled.

The amount dredged under this contract during the fiscal year was 613,078 cubic yards, and the total amount dredged during the whole duration of the contract was 17,836,538 cubic yards, including 2,215,981 cubic yards dredged from below the required depth.

Advertisement was made for offers to continue excavating Ambrose channel under contract, proposals to be received January 8, 1907. No offers were received.

*Data concerning the annulled contract.*—Now that work under this contract has ceased and the contract has been annulled, it seems expedient to place on record the several steps which led to failure on an important work, undertaken by men of ample means and of a general reputation for carrying out what they undertake.

The specifications for this work, dated March 25, 1899, provided for excavating not more than 39,020,000 cubic yards, prism measure-

ment; work to be begun within twelve months and to be prosecuted thereafter at an average monthly rate of 400,000 yards for the eight working months of the first year, and 1,200,000 yards for each of the eight working months of each succeeding year; no payments to be made when the amounts of excavation were less than required; material dredged from below the required depth of 40 feet not to be paid for.

*Contract of May 12, 1899.*—But one bid was received, and in accordance therewith a contract was entered into May 12, 1899, for 42,500,000 cubic yards excavation, measured in scows or other vessels, at rate of 9 cents per cubic yard; work to begin May 24, 1900.

The contractor formed a company for carrying out this contract and built two large dredges of the Liverpool type, patterned after the dredges *Crow* and *Brancher*, and about 50 per cent larger. He found himself unable to get these dredges completed within a year, and therefore could not begin dredging May 24, 1900; he actually began January 23, 1901, removing one load and then stopping for repairs and alterations, and continuous work was not begun until April 4, 1901. This left him with nearly a year's arrearage in amounts required, which would have to be made up before payments could be made. He thought he would be unable to keep up the required rate and also make good the deficiency, and at his request a modification of the contract was made.

*First supplemental agreement, July 18, 1901.*—This provided that the time for beginning should be changed (from May 24, 1900) to July 1, 1901, and that the material dredged prior to such new date for beginning should be paid for at the rate and under the conditions of the contract. Under this provision payments were made up to the summer of 1902, the contractor falling slightly behind the rate required for the first year's work (400,000 yards per working month) and being ahead only on account of the amount dredged and accepted before the change in date for beginning. He saw that it would be impossible for him to earn payments after the rate of 1,200,000 cubic yards per working month went into effect, and at his request another modification of the contract was allowed.

*Second supplemental agreement, July 14, 1902.*—This provided that the rate of excavation required as a condition of payment be reduced to not less than 400,000 yards per working month and to aggregate not less than 4,000,000 yards per year; it provided that the proportionate increase in cost of supervision, examinations, etc., should be deducted semiannually from payments, and because of the great resultant delay in completion of the project it provided that the United States should have the right to further the progress of the work by putting on other dredges if they could be obtained or by any other practicable steps. Thereafter a standing offer was informally open to any dredging men who had a plant capable of making 40 feet depth to take part in this work at the rate of 9 cents per cubic yard. Some contractors looked into the work, but none of them was ready to make a trial.

In March, 1903, Congress made appropriation for this work largely in excess of estimates of what would be required for the contract. This action was for the purpose of building a Government plant to supplement the failing work of the contractor and to hasten the com-

pletion of the channel. Two dredges were built, which began work, respectively, in November, 1904, and April, 1905, and which have since been effectively employed upon this work.

The contractor continued work and kept up with the rates required for payment until July 31, 1903, when he fell behind again. At this time his plant had to be taken off for extensive repairs, and the prospect of making up the deficiency was not good. At his request another modification of the contract was made.

*Third supplemental agreement, February 24, 1904.*—This provided that as a condition for payment no excavation should be required for the period from August 1 to December 1, 1903, the other stipulations of the original contract and previous modifications to remain in force. Under this agreement payment was made for work done up to February 28, 1904, when the contractor again fell behind the rate required, and no payment could be made. He then applied for a further reduction of the rate for excavation. The plant was continually becoming less efficient—whether through deterioration or mismanagement, or both, need not here be considered—and to avoid the necessity of further repeated changes a complete abandonment of any rate of excavation as a condition of payment was consented to.

*Fourth supplemental agreement, May 25, 1905.*—This provided that all previous requirements of rate of excavation as a condition of payment should be waived and that in lieu thereof the contractor should keep his full plant and outfit employed upon the work continuously, except as prevented by weather and by necessary repairs.

Under this agreement the plant worked until October, 1906, with many delays for repairs, which seemed to be of undue length. October 1, 1906, the dredge *Thomas* was withdrawn from the work, ostensibly for repairs. Payment for the work of September was made October 5, and on October 8 the *Mills* was withdrawn and notification given that these dredges would not return to the work.

These several supplemental agreements are so many concessions to the contractor, none of them as advantageous to the United States as the original contract. They were consented to—

First. Because it became evident that the contractor could not, with his plant, comply with the conditions as to rate of work, and there was no other known and available plant fitted for excavating to 40 feet depth in a location nearly as exposed as the open sea.

Second. Because, afterwards, when it was apparent that a Government plant must be depended upon to complete the work, the demand for an early opening of the channel had become so urgent that any assistance, by any plant, must be made use of.

Such concessions as were granted in this case ought not to be accepted as a precedent for different conditions. Had the excavation of Ambrose channel been work of a kind which could be done by the ordinary harbor dredges, or had the need for an early opening of a deep-water entrance to New York Harbor been less imperative, such variations from the original contract could hardly have been recommended or adopted.

The price offered for this work, 9 cents per cubic yard, was amply sufficient for operating expenses. It was not high enough to admit of a reasonable sinking fund against the original cost of dredges which had to be built for the work; a price of 12 or 13 cents would

not have been unduly large. The rate of work required was such as to need a plant of at least double the capacity of the contractor's; his anticipations of its probable efficiency were sanguine in the extreme.

To secure the most economical results under those conditions the work should have been done by an engineer with skill and experience in dredging works. Unfortunately the contractor had not this experience himself and he did not seem to realize its absolute necessity in his working force.

*United States dredges.*—The dredges *Manhattan* and *Atlantic* have been at work on the northeast half of Ambrose channel at its inner part, between points 23,000 and 35,000 feet from the outer 40-foot curve. During the fiscal year they have removed 3,731,962 cubic yards of mud, sand, stones, and other refuse, making depths of about 35 feet in the sections dredged.

From February 11 to March 30, 1907, the U. S. dredge *Delaware*, belonging to the Delaware River improvement, was employed upon Ambrose channel, the Delaware River being closed by ice. She dredged 289,602 cubic yards of material, working in the same part of the channel where the *Manhattan* and *Atlantic* were at work. The arrangement upon which she came was that she was to be paid 9 cents per cubic yard for material excavated, less such part of her operating expenses as might be more conveniently paid here.

The material in this part of the channel consisted of mud about 5 feet deep and overlying a very fine sand. The mud was foul and contained a large amount of garbage and refuse and frequent piles of small stones; the locality had undoubtedly been used many years ago as a general dumping ground. The dredges find no particular difficulty in excavating any of this material, except such stones as are too large to pass through the drags, and are gradually pulled off into deeper water. This process is slow, and may make it expedient to resort to other means for removing the stones.

The total amounts dredged from Ambrose channel up to June 30, 1907, are as follows:

	Cubic yards.
Under contract, by dredges <i>Thomas</i> and <i>Mills</i> .....	17, 836, 538
By U. S. dredges <i>Manhattan</i> and <i>Atlantic</i> .....	7, 993, 811
By U. S. dredge <i>Delaware</i> , in 1907.....	289, 602
By U. S. dredge <i>Gedney</i> , in 1903.....	188, 963
Total.....	26, 308, 914

A channel 35 feet deep has been made through the entire length of Ambrose channel, with widths of 400 to 1,800 feet. The widest part is at the outer end where work was begun under contract and where for a length of a mile and a half the width is from 1,500 to 1,800 feet and the depths nearly 40 feet. Above this for half a mile the width is over 800 feet, followed by a section of the same length with widths from 400 to 800 feet. Then for rather more than 3 miles the 35-foot channel is 800 feet wide, and at the upper end the widths range from 400 to 800 feet. About one-half of this 35-foot channel is 40 feet deep, and many of the shoals of less than 35 feet depth are more than 33 feet.

In adapting the United States dredges to the work in Ambrose channel, several modifications and improvements have been made

from time to time, which are of great usefulness in this class of dredging. The principal ones are:

1. The use of welded suction pipes of increased thickness, with flange bolts of such size that breakage ordinarily occurs in the bolts before the pipes are unduly strained. This has reduced by more than 60 per cent the cost of keeping the dredges supplied with suction pipes.

2. Use of a drag, designed as per plan in Annual Report of 1906, with removable bottom; this drag has increased the pumping efficiency by from 80 to 150 per cent.

3. Elimination of rods inside the bins; the rods have proved unnecessary and better means of staying can be provided outside the bins.

4. Lengthening the lead of hoisting cables between guide blocks and drums, and using high grade steel cables of reduced diameter.

5. Placing the gate rods in pipes.

6. Covering the outboard bearings with stuffing boxes or pipes and forcing lubricating grease into the bearings under pressure from inside the ship. Renewal of these bearings is very expensive; they cut out quickly from the fine sand from the overflows, and with the protection they last more than three times as long as without.

7. Stiffening the dump gates to prevent bending. Leakage at the gates has been found to result as much from deformation as from wear.

8. Using steel instead of brass around all outboard bearings.

9. Using distributing chutes to dump material away from the sides of the bins.

10. Placing condenser intake as far forward as practicable, and forward of the overflows.

11. Modification in construction of boilers, and in operating them, to obviate as far as possible the collapse of furnace crowns; this is yet under observation as to efficiency.

Some of these improvements have been already adopted more or less widely; others doubtless will be generally adopted in dredges and dredging operations; some of them are undoubtedly patentable. The district engineer desires to put on record his appreciation of the value to the engineering service of the United States of the devices, developed mainly by his assistants actually engaged upon the dredging operations in New York Harbor, which have resulted in an increased output of the plant and in a reduction of cost of work.

#### ROCK OFF PIER A.

Under provisions of the river and harbor act of 1905 a contract was made for removal of this rock to 40 feet depth, for the sum of \$40,000. Work on this rock, begun in September, 1905, has been continued during the fiscal year. The contractor's plan of operations is to mount a movable platform (about 24 by 30 feet) upon the rock, supported by four spuds. This platform carries two drills, which are supplied with steam from a barge alongside. From 8 to 15 holes are ordinarily drilled from one position of the platform, depending upon how much successive positions overlap. The holes are charged and blasted soon after drilling. About 190 holes have been drilled and blasted, from 24 positions of the platform, covering approximately three-fourths of the area of the rock.

The contractor intends to drill and blast the entire area before taking out any rock, and no rock has yet been removed.

During the fiscal year the platform has been run into six times and on two occasions was much damaged. These accidents very much delay progress.

#### PRESENT CONDITION OF IMPROVEMENT.

The improved channels to the sea by way of Sandy Hook have a full depth of 30 feet or more. In Main Ship channel the width is reduced to between 500 and 800 feet by deposition of silt along the channel edges, making shoals of 26 to 29 feet depth; the rest of the channel—Bayside and Gedney channels—has a width of 1,000 feet.

The condition of Ambrose channel is as described above.

#### PROPOSED OPERATIONS.

It is proposed to apply the funds available for maintenance to removing shoals in the improved channels, restoring and maintaining the projected depth and width, and to apply the funds for Ambrose channel to extending the channel, with width of about 1,000 feet and depth of at least 35 feet, until a navigable channel of that depth and width is completed, thereafter widening and deepening it as projected, and to apply the funds provided for removal of rock near pier 1, or Pier A, to making a clear depth of 40 feet over the obstruction.

It is estimated that the following expenditures will become necessary under the adopted project between July 1, 1907, and June 30, 1909:

Construction of two new dredges.....	\$800, 000
Operation of dredges <i>Manhattan</i> and <i>Atlantic</i> , two years each, at \$120,000.....	480, 000
Operation of two new dredges, one year each, at \$120,000.....	240, 000
Total.....	1, 520, 000

Of which \$755,438.96 remains, July 1, 1907, from previous appropriations, and it is estimated that \$765,000 additional will be required.

#### *Money statements.*

##### GENERAL IMPROVEMENT.

July 1, 1906, balance unexpended.....	\$52, 207. 23
Amount appropriated by river and harbor act approved March 2, 1907.....	125, 000. 00
	177, 207. 23
June 30, 1907, amount expended during fiscal year, for maintenance of improvement.....	24, 303. 03
July 1, 1907, balance unexpended.....	152, 904. 20
July 1, 1907, outstanding liabilities.....	9, 939. 11
July 1, 1907, balance available.....	142, 965. 09
<div style="display: flex; align-items: center;"> <div style="font-size: 3em; margin-right: 10px;">{</div> <div>           Amount that can be profitably expended in fiscal year ending June 30, 1909, for maintenance of improvement, in addition to the balance unexpended July 1, 1907.....         </div> <div style="margin-left: 20px;">75, 000. 00</div> </div>	
<div style="display: flex; align-items: center;"> <div style="font-size: 3em; margin-right: 10px;">{</div> <div>           Submitted in compliance with requirements of sundry civil act of June 4, 1897, and of section 7 of the river and harbor act of 1899.         </div> </div>	

# 1032 REPORT OF THE CHIEF OF ENGINEERS, U. S. ARMY.

## AMBROSE CHANNEL.

July 1, 1906, balance unexpended.....	\$640,686.50
Amount appropriated by sundry civil act approved March 4, 1907.....	470,000.00
Received from sale of property and maps.....	20.00
	<u>1,110,706.50</u>

June 30, 1907, amount expended during fiscal year:	
For works of improvement.....	\$325,041.01
Transfer settlements, certificates Nos. 33843 and 44686 .....	141.50
	<u>325,182.51</u>

July 1, 1907, balance unexpended.....	785,523.99
July 1, 1907, outstanding liabilities.....	30,085.03

July 1, 1907, balance available.....	<u>755,438.96</u>
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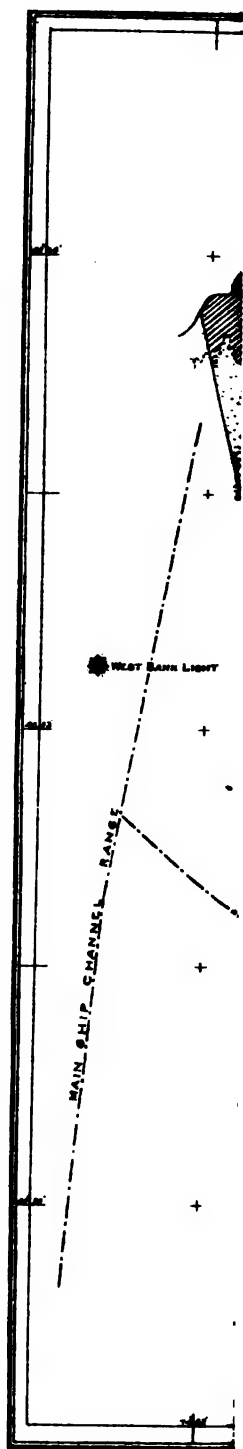
Amount (estimated) required for completion of existing project...	<u>1,635,000.00</u>
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{ Amount that can be profitably expended in fiscal year ending June 30, 1909, for works of improvement, in addition to the balance unexpended July 1, 1907.....	765,000.00
{ Submitted in compliance with requirements of sundry civil act of June 4, 1897.	

Appropriations for improving New York Harbor have been made as follows:

Application.	Date.	Amount.
For Gedney channel, dredging, via Sandy Hook.....	July 5, 1884	\$200,000.00
For New York Harbor.....	Aug. 5, 1886	750,000.00
Do.....	Aug. 11, 1888	380,000.00
Do.....	Sept. 19, 1890	160,000.00
Do.....	July 13, 1892	170,000.00
Do.....	Aug. 18, 1894	75,000.00
Do.....	June 3, 1896	60,000.00
Do.....	Mar. 3, 1899	100,000.00
Do.....	June 6, 1900	1,500.00
Do.....	June 13, 1902	50,000.00
Do.....	Apr. 28, 1904	15,000.00
Do.....	do.....	15,000.00
Do.....	Mar. 3, 1905	75,000.00
Do.....	Mar. 2, 1907	125,000.00
Received from other sources.....		<u>2,176,500.00</u>
Total.....		<u>2,204,524.52</u>
For East (Ambrose) channel, dredging .....	Mar. 3, 1899	1,000,000.00
Do.....	Mar. 3, 1901	180,000.00
Do.....	June 28, 1902	160,000.00
Do.....	Mar. 3, 1903	738,000.00
Do.....	Apr. 29, 1904	50,000.00
Do.....	Mar. 3, 1905	715,510.00
Do.....	June 30, 1906	265,000.00
Do.....	Mar. 4, 1907	470,000.00
Total.....		<u>3,513,510.00</u>
Amount diverted for removal of rock in North River, by joint resolution of July 1, 1902, and by river and harbor act of March 3, 1903 .....		<u>45,000.00</u>
Received from other sources.....		<u>3,468,510.00</u>
Aggregate .....		<u>1,848.96</u>
		<u>3,470,358.96</u>







## CONTRACTS IN FORCE.

With Andrew Onderdonk, of New York, N. Y., for excavating in East (Ambrose) channel, New York Harbor, and removing about 42,500,000 cubic yards of material, at a rate of 9 cents per cubic yard. Date of contract, May 12, 1899; approved by the Chief of Engineers May 24, 1899; supplemental articles of agreement dated July 18, 1901, July 14, 1902, February 24, 1904, and May 25, 1905; approved by the Secretary of War August 5, 1901, August 8, 1902, March 5, 1904, and June 14, 1905, providing for beginning work July 1, 1901, instead of May 24, 1900; for making payments when the rate of excavation is 4,000,000 yards per year, instead of 9,600,000 yards; that as a condition precedent to payments no excavation is required for the period from August 1, 1903, to December 1, 1903; the United States to have the right to further the rate of progress at any time and with any plant which can be obtained, and as a condition precedent to payments, that instead of specific amount it is required that the dredges shall be kept at work; date of expiration of contract indefinite, depending upon appropriations of Congress. Contract annulled, by sanction of the Chief of Engineers, December 3, 1906.

With John D. Miller, of New York, N. Y., for removal of rock off Pier A, North River, New York Harbor. Date of contract, June 5, 1905; approved by the Chief of Engineers June 17, 1905; time of completion extended by the Chief of Engineers; contract price, \$40,000.

## COMMERCIAL STATISTICS.

The following statement concerning foreign commerce of the port of New York is compiled from the annual report of the Chamber of Commerce of the State of New York for the year 1906-7. It comprises only imports from and exports to foreign countries for the year ending June 30, 1906, and does not include the domestic, coastwise, and local traffic. Vessels trading with domestic ports do not take out clearance papers, and no statistics of their carrying trade are accessible.

The leading articles of import into the United States at the port of New York for the year ending June 30, 1906, were sugar, tea and coffee, wool, clothes and dress goods, leather and leather goods, tin, rubber, tobacco, and rope fibers, which, with other miscellaneous imports, aggregated about 4,315,000 tons, valued at \$794,639,232.

The value of such imports for all other ports of the United States for the same period was \$572,587,484.

The leading articles of export were cotton, breadstuffs and other provisions, oils, tobacco, metals, and manufactures, which, with other items, amounted to about 7,467,000 tons, valued at \$666,173,124.

The value of such exports from all other ports of the United States for the same period was \$1,182,134,035.

*Statement of the number and tonnage of all vessels belonging to the port of New York June 30, 1906.*

	Number.	Tonnage.
Sailing vessels.....	1,116	276,190
Steam vessels.....	1,580	918,098
Canal boats.....	230	28,701
Barges.....	1,365	348,095
Total.....	4,291	1,571,084

From the records of the New York and New Jersey pilot commissioners' offices the following data concerning deep-draft vessels crossing Sandy Hook bar have been compiled for the calendar year 1906:

Draft.	Outward.		Inward.	
	Number of vessels.	Number of trips.	Number of vessels.	Number of trips.
32 feet and over.....	4	4	.....	.....
31 feet and under 32.....	16	43	1	1
30 feet and under 31.....	33	112	1	1
29 feet and under 30.....	47	132	4	18
28 feet and under 29.....	78	192	10	28
27 feet and under 28.....	94	183	17	89
Total.....	.....	666	.....	132

The total number of different ships of 27 feet draft or over is 133.

The maximum draft of ships leaving the harbor in 1906 was 32 feet 6 inches; the maximum draft of ships entering was 30 feet. Ships are of greater draft when outward bound than when coming in, having a full supply of coal and generally carrying heavier freights.

Before the improvement of Gedney channel vessels drawing 27 feet could cross the bar at extreme high tide only.

## F 2.

### IMPROVEMENT OF BAY RIDGE AND RED HOOK CHANNELS, NEW YORK HARBOR.

These channels on the east side of New York Harbor are designed, under the existing project for making them 40 feet deep at mean low water and 1,200 feet wide, to afford a deep-water approach to the wharves along the South Brooklyn shore.

#### OPERATIONS DURING THE FISCAL YEAR ENDING JUNE 30, 1907.

Under the continuing contract for making these channels 1,200 feet wide and 40 feet deep, dredging was continued until November 24, when the plant was withdrawn from the work. The contractors were repeatedly called upon to resume work, but gave no sufficient explanation of their failure to do so. It was currently reported that they had sold their plant and that the new owners refused to be bound by the contract for dredging these channels. On February 21, 1907, the contract was annulled with sanction of the Chief of Engineers.

During the fiscal year, under this contract 1,204,001 cubic yards of material were removed, of which 681,491 yards were from the upper end of Bay Ridge channel, on the side leading toward Gowanus Creek, 52,319 yards were from the west edge of Bay Ridge channel below Fifty-fifth street, and 470,191 yards were from Red Hook channel.

Red Hook channel was dredged to depths between 30 and 40 feet above Erie Basin entrance and out to the west edge of the channel. The dredge *Onondaga* sank in her cut at this work on October 27, leaving a comparatively small shoal in front of her along the west edge. The east half of this channel above Erie Basin was deepened, but not quite to the channel edge.

The upper end of Bay Ridge channel, on the east side toward Gowanus Creek, was deepened to between 26 and 35 feet, and the west part of the channel between Fifty-fifth street and Sixty-fifth street was widened out to 1,100 feet.

Proposals have been invited for the further work required to make these channels 35 feet deep as far as the available funds permit.

#### PRESENT CONDITION OF IMPROVEMENT.

Bay Ridge channel has now a depth of 30 feet or more, with width of 900 to 1,150 feet, from its outer end up to Fortieth street; it has a navigable width (generally over 600 feet) with 33 feet depth. Above Fortieth street it has a depth of 26 feet to Gowanus Creek and a depth of about 30 feet to Red Hook channel.

Red Hook channel has been dredged 1,200 feet wide and 26 feet deep or over in its upper half and for part of its lower half, leaving undredged areas opposite Erie Basin and at the lower end of the channel adjoining Bay Ridge channel, at which points the width is about 800 feet.

#### PROPOSED OPERATIONS.

The river and harbor act of 1907 contained the following provision relating to the improvement of Bay Ridge and Red Hook channels:

The Secretary of War may prosecute the improvement in said channels with a view to obtaining a depth of thirty-five feet and subsequently increasing said depth to the full forty feet with a width of twelve hundred feet in accordance with the project adopted in the river and harbor act of eighteen hundred and ninety-nine.

With the available funds it is proposed to make Bay Ridge channel 35 feet deep and at least 1,000 feet wide up to Fortieth street, to extend the 35-foot channel up toward Gowanus Creek, and to remove shoals from Red Hook channel, or to do so much of this work as may be, depending upon prices obtained.

These channels are in the collection district of New York, of which New York City is the port of entry. The nearest light-house is the Statue of Liberty Enlightening the World, on Bedloe Island, about  $1\frac{1}{2}$  miles west. The nearest work of defense is Fort Jay, Governors Island, New York Harbor.

#### *Money statement.*

July 1, 1906, balance unexpended.....	\$417, 679. 80
Amount appropriated by sundry civil act approved March 4, 1907....	200, 000. 00
Received from sale of condemned property and maps.....	23. 00
	<hr/>
	617, 702. 80
June 30, 1907, amount expended during fiscal year, for works of improvement .....	160, 983. 23
	<hr/>
July 1, 1907, balance unexpended.....	456, 719. 57
July 1, 1907, balance available.....	456, 719. 57
	<hr/>
{ Amount that can be profitably expended in fiscal year ending June 30, 1909, for works of improvement, in addition to the balance unexpended July 1, 1907.....	200, 000. 00
{ Submitted in compliance with requirements of sundry civil act of June 4, 1897.	

Appropriations for improving Bay Ridge and Red Hook channels, New York Harbor, have been made as follows:

*For previous projects.*

Application.	Date.	Amount.	Application.	Date.	Amount.
Dredging.....	Mar. 4, 1881	\$40,000	Dredging .....	Aug. 18, 1894	\$150,000
Do.....	Aug. 2, 1882	20,000	Do.....	June 3, 1896	= 530,000
Do.....	July 5, 1884	5,000	Do.....	June 4, 1897	
Do.....	Aug. 5, 1886	7,500	Do.....	July 1, 1898	
Do.....	Aug. 11, 1888	60,000	Total.....		b 1,171,100
Do.....	Sept. 19, 1890	160,000			
Do.....	July 13, 1892	198,600			

\* These three appropriations, aggregating \$680,000, were applied under continuing contract to dredging Bay Ridge, Red Hook, and Buttermilk channels. It is estimated that about \$530,000 were applied to Bay Ridge and Red Hook channels.

† This total includes small sums applied to dredging in Gowanus Canal, the amounts of which are not definitely known.

*For present project of 1899.*

Application.	Date.	Amount.	Application.	Date.	Amount.
Dredging.....	Mar. 3, 1899	\$100,000	Dredging .....	Mar. 4, 1907	\$200,000
Do.....	June 6, 1900	262,000			1,699,000
Do.....	Mar. 3, 1901	140,000			
Do.....	June 28, 1902	100,000	Received from sale of condemned property.....		23
Do.....	Mar. 3, 1903	272,000	Total .....		1,699,023
Do.....	Apr. 28, 1904	175,000			
Do.....	Mar. 3, 1905	200,000			
Do.....	June 30, 1906	250,000			

CONTRACT IN FORCE.

For excavating Bay Ridge and Red Hook channels, 1,200 feet wide and 40 feet deep at mean low water, removing 22,000,000 cubic yards, more or less, at 10 cents per cubic yard, measured in scows.

Name of contractors: Hughes Brothers & Bangs, of Syracuse, N. Y.

Date of contract: July 31, 1899; supplemental contract, dated May 7, 1902, provides for beginning work November 1, 1901, instead of May 14, 1900; also, supplemental contract, dated July 28, 1903, requiring rate of 200,000 yards per month from April 1 to December 31, 1903; also supplemental contract, dated March 3, 1904, requiring the full employment of the plant, instead of a stated amount of excavation, as a condition of payment. All the supplemental contracts provide for charging costs of administration against the contractor for any excess of time over that contemplated in the original agreement.

The contract was annulled, by sanction of the Chief of Engineers, February 21, 1907.

COMMERCIAL STATISTICS FOR THE CALENDAR YEAR 1905.

	Approximate amount.	Estimated value.
Bay Ridge channel, Ninety-second to Twenty-eighth streets:	<i>Tons.</i>	
Receipts .....	1,110,000	\$51,485,000
Shipments .....	630,000	32,520,000
Total.....	1,740,000	84,005,000

Red Hook channel has no commercial docks except those in Erie Basin, and it has been impracticable to get data as to amounts of freight. The number of vessels entering and leaving for the purpose of discharging or carrying cargoes is reported as 335, and the freight may be approximately estimated at one-sixth that of Bay Ridge channel.

The above includes only freight received and shipped at docks. In addition, about 3,000,000 tons of freight pass through these channels to and from Gowanus Creek and Canal. Other freights pass through to various destinations, the amount of which there is no means of estimating.

It is impracticable to secure accurate data of the amounts of freight handled in the various parts of New York Harbor, records being not generally kept.

Statistics for the year 1906 have been promised, but are not yet received; they would not differ greatly from those of 1905, as above given.

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### F 3.

#### ENLARGEMENT OF GOVERNORS ISLAND, NEW YORK HARBOR.

This project was adopted under authority of the sundry civil act of March 3, 1901, and consists in enlarging the island by reclaiming land under water on the shoal southwest of the island, inclosing the enlargement by a sea wall, building a dock on the north shore of the island, and deepening the approach of the dock and constructing buildings for military uses.

The parts of this work assigned to the Engineer Department were the enlargement proper with sea wall, estimated to cost \$885,000, the new dock and refitting an old dock, estimated at \$115,000, and dredging to the dock, estimated at \$100,000; total estimated cost, \$1,100,000.

The original plan for reclaiming 82 acres of land under water was extended to 101 acres by approval of the Secretary of War. No new estimate of cost has yet been made.

#### OPERATIONS DURING THE FISCAL YEAR ENDING JUNE 30, 1907.

1. *Embankment.*—Delivery of material and building up the embankment under contract was continued until October 17, and 65,399 cubic yards of material, mainly sand, were delivered on scows and dumped within the inclosed area; 43,645 cubic yards of filling were pumped up into the embankment above mean low water level. The total amount of material delivered in the inclosure is 2,097,062 cubic yards, of which 432,231 cubic yards were placed in the embankment above mean low water. On September 17, when the amount of material dumped in the inclosure was the full amount authorized by the contract, the contractor claimed that the contract was completed, notwithstanding that the specific provision that the embankment must be built up to certain specified grades before completion had not been complied with. The contractors refused to complete the work of building the embankment, and with the sanction of the Chief of Engineers, the contract was annulled June 8, 1907, and proposals for further embankment construction are about to be received.

2. *Masonry sea wall.*—At the beginning of the year 6,795 linear feet of riprap bulkhead had been placed, upon which 4,775 feet of masonry sea wall had been built. During the year the masonry wall has been extended 1,982 feet, making it 6,757 feet long.

Levels taken in June, 1907, show that the wall has settled in one place nearly 3 inches. As 2 inches settling was provided for in construction at this point, where the bottom is soft, the wall is about 1 inch below the desired level. The settling took place so uniformly

and gradually that no cracks appeared in the wall. During the year 6,019 tons of riprap were placed along the base of the wall to protect it against undermining and to check settling.

In March the sea wall was run into on the Buttermilk Channel side, at about 2,000 feet from the original island. The coping course was forced out of line, 4 inches at maximum, for a length of 110 feet, and the course immediately below was driven backward, 14 inches maximum, for 90 feet length; the lower courses were undisturbed, except pointing at three joints. The upper courses and concrete backing have been taken up and relaid at a total cost of \$750. It is supposed that a tugboat ran into the wall at high tide during a thick snow storm, striking her rope stem fender against the second course of the wall. Pieces of fender were found in the wall and a large sheet of copper, such as is used for ice protection on the bow of tugs, was found wrinkled and torn on the riprap below.

The wall at this point is as conspicuous and as well known as any unlighted water front, and the boat must have lost its course completely.

The masonry sea wall is built of uncoursed ashlar on a concrete bed 7 feet wide and  $1\frac{1}{2}$  feet thick. The top of the concrete is 1.7 feet above mean low water, and the top of the 3-foot coping course of the granite wall is 10.4 feet above mean low water.

The frame building on the sea wall, used as a local office and storeroom, was struck by lightning and completely burned July 17, 1906. A similar building was put up to replace it, at a cost of \$496.26.

#### PRESENT CONDITION OF WORK.

Following is the condition of the several items included in the project and assigned to the Engineer Department:

1. Building new dock and refitting old dock, completed August, 1902.

2. Dredging at new dock, completed July, 1902. During the dredging a small ledge rock was uncovered which was removed in July, 1903.

3. Riprap bulkhead around enlargement of the island is about 7,147 feet long, 6,795 feet completed, a gap about 352 feet wide being left for bringing material for the embankment. The bulkhead may be reckoned as about 93 per cent completed.

4. Masonry sea wall on bulkhead: Projected length about 7,180 feet, including parts of old sea wall removed; completed 6,757 linear feet, or about 94 per cent. The unfinished part, about 420 feet, is the gap left to bring in material for embankment; the masonry wall is built to within about 30 feet of the end of the riprap at this gap.

5. Embankment within sea wall: Estimated amount of material required, about 4,500,000 cubic yards in place, about 2,000,000 yards of which would be above low water. Up to June 30, 1907, 2,097,062 cubic yards (scow measure) have been delivered, of which but 432,231 yards (place measure) have been built up above mean low-water level. This work is considered about 21 per cent completed.

Estimates from recent surveys show that the amount yet required to fill the entire inclosure to grades proposed is 2,490,000 cubic yards,



measured in place, of which 1,650,000 yards would be above the plane of mean low water.

#### PROPOSED OPERATIONS.

It is proposed to apply the available funds to continuing building embankment. It is estimated that \$75,000 may be profitably expended upon this work during the year ending June 30, 1909.

#### *Money statement.*

July 1, 1906, balance unexpended.....	\$400, 761. 50
Amount appropriated by sundry civil act approved March 4, 1907..	100, 000. 00
	<hr/> 500, 761. 50
June 30, 1907, amount expended during fiscal year, for works of improvement.....	74, 649. 00
	<hr/> 426, 112. 50
July 1, 1907, balance unexpended.....	426, 112. 50
July 1, 1907, outstanding liabilities.....	94. 00
	<hr/> 426, 018. 50
July 1, 1907, balance available.....	426, 018. 50
Amount (estimated) required for completion of existing project....	75, 000. 00
	<hr/> <hr/>
{ Amount that can be profitably expended in fiscal year ending June 30, 1909, for works of improvement, in addition to the balance unexpended July 1, 1907.....	75, 000. 00
{ Submitted in compliance with requirements of sundry civil act of June 4, 1897.	

The appropriations made for this work, as far as relates to the Engineer Department, are as follows:

Sundry civil act, March 3, 1901 (\$260,000), allotted to Engineer Department.....	\$200, 000
General deficiency act of July 1, 1902.....	200, 000
Sundry civil act of March 3, 1903.....	150, 000
Sundry civil act of April 28, 1904.....	200, 000
Sundry civil act of March 3, 1905.....	100, 000
Sundry civil act of March 4, 1907.....	100, 000
	<hr/>
Total .....	950, 000

#### CONTRACTS IN FORCE.

##### Building embankment:

Name of contractor: New York Filling Company, New York City.

Date of contract: December 24, 1902.

Date of approval: January 12, 1903.

Date of completion: 1906.

Contract was annulled, by sanction of the Chief of Engineers, June 8, 1907.

##### Building stone sea wall:

Name of contractor: Brown & Fleming Contracting Company, New York City.

Date of contract: July 14, 1905.

Date of approval: August 4, 1905.

Date of beginning: October 3, 1905.

Date for completion: July 31, 1907; actually completed June 18, 1907.

Price per linear foot: \$20.25.

## F 4.

## REMOVING SUNKEN VESSELS OR CRAFT OBSTRUCTING OR ENDANGERING NAVIGATION.

*Schooner Hattie Douglass.*—The *Hattie Douglass* was a small and old fishing boat, 34 feet length and 13 feet beam, built in 1873. On or about March 12, 1907, she sank in the Lower Bay, New York Harbor, and lay in 13 feet of water on Flynn's Knoll, about 750 feet north of buoy 8, Bayside channel, abandoned by her owners, and so near the main harbor channel that she was liable to be moved into it by storms. It is reported that the schooner's timbers were opened by ice floes.

After obtaining offers for removal and reporting the facts to the Chief of Engineers, an allotment of \$390 was made to pay for removal, and the lowest offer for the work, made by the Merritt & Chapman Derrick and Wrecking Company, was accepted, naming \$425 as price of removal, and offering \$35 for the vessel and contents; net cost, \$390.

The contractors removed the wreck April 16, lifting it bodily and depositing it on the beach above high water at their private water front, at Stapleton, Staten Island, where inspection, made April 17, showed that the wreck was in a badly broken-up condition, but all the principal timbers were accounted for except the masts, which had broken off. No name was visible on any part of the wreck; the name was learned from newspaper accounts at the time of sinking.

## APPENDIX G.

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### IMPROVEMENT OF RIVERS AND HARBORS IN NORTHEASTERN NEW JERSEY.

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REPORT OF COL. D. W. LOCKWOOD, CORPS OF ENGINEERS, OFFICER  
IN CHARGE, FOR THE FISCAL YEAR ENDING JUNE 30, 1907.

#### IMPROVEMENTS.

- |  |   |
|--|---|
| <ol style="list-style-type: none"><li>1. Passaic River, New Jersey.</li><li>2. Arthur Kill, or Staten Island Sound, New York and New Jersey, and channel between Staten Island and New Jersey.</li><li>3. Woodbridge Creek, New Jersey.</li><li>4. Raritan Bay, New Jersey.</li><li>5. Keyport Harbor, Matawan Creek, Raritan, South, and Elizabeth rivers, Shoal Harbor and Compton Creek, and Cheesequake Creek, New Jersey.</li></ol> | <ol style="list-style-type: none"><li>6. Shrewsbury River, New Jersey.</li><li>7. Manasquan River, New Jersey.</li><li>8. Removing sunken vessels or craft obstructing or endangering navigation.</li></ol> |
|--|---|

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UNITED STATES ENGINEER OFFICE,  
*New York City, July 9, 1907.*

GENERAL: I have the honor to transmit herewith the annual reports upon the works of river and harbor improvement under my charge in northeastern New Jersey for the fiscal year ending June 30, 1907.

Very respectfully, your obedient servant,

D. W. LOCKWOOD,  
*Colonel, Corps of Engineers.*

Brig. Gen. A. MACKENZIE,  
*Chief of Engineers, U. S. A.*

## G 1.

## IMPROVEMENT OF PASSAIC RIVER, NEW JERSEY.

Detailed descriptions of this river and of the project for its improvement are printed in the Annual Report of the Chief of Engineers for 1900, pages 177 and 1530 to 1552, and a condensed history is contained in current summary.

## OPERATIONS DURING THE PAST FISCAL YEAR.

Dredging operations during the past fiscal year have been carried on under four contracts.

Under the contract in force with Kirk, Driscoll & Co., dated March 1, 1904, dredging was in progress at the close of the last fiscal year and was continued to November 26, when the contract was completed. One dredge was employed on the work to October 3 and two after that date. The amount of material dredged during the year was 56,022 cubic yards. This work and the total under the contract is shown in the following table.

The dredged material was disposed of by the contractor by depositing it in the east side of the river, in section 4, whence it was pumped ashore on the marsh to make useful land between the Passaic and Hackensack rivers.

Under the contract in force with P. Sanford Ross (Incorporated) work was in progress at the close of the last fiscal year. Dredging was continued to November 14 when the plant was withdrawn and the work suspended for the winter. One dredge was employed except from July 18 to August 7, and October 10 to 24, when two were at work. Dredging was resumed with one dredge in section 8 on June 17 and has been in progress since that date. The amount dredged during the year was 84,540 cubic yards in the locations shown in the following table.

The dredged material was dumped near the shore on the west side of Newark Bay, whence it was pumped ashore on the marsh land for the reclamation of same.

Under advertisement of September 10, proposals were opened on October 11, 1906, for further dredging under the project of June 13, 1902, and the bid of the International Contracting Company, the lowest of three received, to do the work at 25 cents per cubic yard, was recommended for acceptance. This recommendation was approved by the Department, and a contract, dated November 14, 1906, was entered into. Dredging under this contract was commenced on April 4, 1907, and was in progress at the close of the fiscal year, when 43,289 cubic yards had been removed. The location of work is shown in the following table. One dredge was employed and the dredged material was dumped in a basin on the north side of the river in "section 5," whence it was pumped ashore on the lowlands of the Pennsylvania Railroad Company.

*Table showing progress of dredging in Passaic River upon contracts in force and completed, and parts of sections dredged and completed under the project of June 13, 1902, for a channel 200 feet wide and 12 and 10 feet deep at mean low water.*

[Total amount of contracts: Kirk, Driscoll & Co., 500,000 cubic yards; P. S. Ross (Incorporated), 707,000 cubic yards; International Contracting Co., 157,600 cubic yards.]

Sec.	Location and name of contractor.	Amount dredged in fiscal year ending June 30, 1907.	Total amount removed under contract.	Proportion of section completed.
1	Deep water in Newark Bay to Lehigh Valley R. R. Bridge (3,500 yards): Kirk, Driscoll & Co.....	<i>Cu. yds.</i> 6,993	<i>Cu. yds.</i> 104,759	100
	P. S. Ross (Incorporated).....		255,404	
2	Lehigh Valley R. R. Bridge to Newark and New York R. R. Bridge (3,000 yards): Kirk, Driscoll & Co.....	23,589	119,288	100
3	Newark and New York R. R. Bridge to Newark plank road bridge (1,200 yards): Kirk, Driscoll & Co.....	10,737	105,184	100
4	Plank road bridge to Pennsylvania R. R. freight bridge (1,400 yards): Kirk, Driscoll & Co.....		32,751	100
5	Pennsylvania R. R. freight bridge to Jackson Street Bridge (3,530 yards): Kirk, Driscoll & Co.....	14,703	100,473	100
	P. S. Ross (Incorporated).....	3,889	181,189	
6	Jackson Street Bridge to Pennsylvania R. R. Bridge, Market Street (660 yards): P. S. Ross (Incorporated).....	7,799	7,799	100
7	Pennsylvania R. R. Bridge, Market Street to Center Street Railroad Bridge (660 yards): Kirk, Driscoll & Co.....		18,248	100
	P. S. Ross (Incorporated).....	25,598	25,598	
8	Center Street R. R. Bridge to Bridge Street highway bridge (530 yards): Kirk, Driscoll & Co.....		19,147	75
	P. S. Ross (Incorporated).....	12,552	12,552	
9	Bridge Street Bridge to Delaware, Lackawanna & Western R. R. Bridge (260 yards): P. S. Ross (Incorporated).....	10,780	10,780	100
	International Contracting Co.....	8,066	8,066	
10	Delaware, Lackawanna & Western R. R. Bridge to Clay street highway bridge (460 yards): P. S. Ross (Incorporated).....	15,198	15,198	100
	International Contracting Co.....	6,800	6,800	
11	Clay Street Bridge to New York, Lake Erie & Western R. R. Bridge (430 yards): P. S. Ross (Incorporated).....	7,526	7,526	100
	International Contracting Co.....	7,775	7,775	
12	New York, Lake Erie & Western R. R. Bridge to Naim Linoleum Works (1,100 yards): P. S. Ross (Incorporated).....	1,198	1,198	20
	International Contracting Co.....	20,648	20,648	
13	Naim Linoleum Works to Montclair and Greenwood Lake R. R. Bridge (2,000 yards): P. S. Ross (Incorporated).....			
	International Contracting Co.....			
	Total (18,760 yards): Kirk, Driscoll & Co.....	56,022	499,850	
	P. S. Ross (Incorporated).....	84,540	517,194	
	International Contracting Co.....	43,289	43,289	

The dredging in the areas worked upon has been carried to the depth required for forming a channel of the projected depth of 12 feet at mean low water. An allowance of from 1 to 3 feet for over-depth in dredging is usually required to leave full 12 feet. Channels of 12 feet in depth and from 100 to 200 feet in width have been completed from Newark Bay to a point about one-third mile above the New York and Lake Erie Railroad bridge, Newark.

Under specifications dated August 28, 1906, proposals were opened on September 28 for dredging above the Montclair and Greenwood Lake Railroad bridge. Two bids were received, and the lower, that of John and Joseph McSpirit, to do the required dredging at the rate of 75 cents per cubic yard, was recommended for acceptance. This recommendation was approved by the Department on October

16, and a contract dated October 23, and approved October 30, 1906, was entered into.

Dredging under this contract was begun on November 19 and continued to December 27, when work was suspended for the winter. It was resumed on April 12, 1907, and was in progress at the close of the fiscal year.

Ten thousand eight hundred and fourteen cubic yards of material and 21.19 cubic yards of bowlders were removed under this contract during the year from Belleville and Rutherford Park bars, and the work accomplished consisted in restoring the channel at Belleville bar to 100 feet width, and at Rutherford Park bar to 100 feet width for a length of about 1,950 feet above and below the highway bridge, with depth of 6 to 7 feet at mean low water. The material was disposed of by depositing it behind the dikes on the east side of the river at each locality.

Project for expenditure of appropriation of \$46,000 from sundry civil act approved June 30, 1906, was approved on February 26, 1907. It provides for completion of dredging required under project adopted by river and harbor act of June 13, 1902.

Project for expenditure of the appropriation of \$53,000, act of March 2, 1907, was approved on March 23. It provides for the completion of the improvement of the Passaic River above and below the Montclair and Greenwood Lake Railroad bridge under existing projects of 1872 and 1902 and maintenance of same.

Project for expenditure of the appropriation of \$200,000 and \$650,000 authorized by act of March 2, 1907, was approved on March 23, 1907. It provides for dredging in accordance with the adopted project.

Specifications for dredging under this project were advertised under date of June 29, proposals to be opened July 30, 1907.

#### *Money statement.*

July 1, 1906, balance unexpended.....	\$199, 724. 36
Amount appropriated by river and harbor act approved March 2, 1907.....	253, 000. 00
Received from sale of blueprints during the year.....	27. 10
	<hr/>
	452, 251. 46
June 30, 1907, amount expended during fiscal year:	
For works of improvement.....	\$49, 308. 64
For maintenance of improvement.....	4, 907. 18
	<hr/>
	54, 215. 82
July 1, 1907, balance unexpended.....	398, 535. 64
July 1, 1907, outstanding liabilities.....	20, 154. 25
	<hr/>
July 1, 1907, balance available.....	378, 381. 39
July 1, 1907, amount covered by uncompleted contracts.....	75, 889. 91
Amount (estimated) required for completion of existing project..	1, 018, 775. 00
	<hr/>
Amount that can be profitably expended in fiscal year ending June 30, 1909, in addition to the balance unexpended July 1, 1907:	
For works of improvement.....	\$100, 000. 00
For maintenance of improvement.....	20, 000. 00
	<hr/>
	120, 000. 00
Submitted in compliance with requirements of sundry civil act of June 4, 1897, and of section 7 of the river and harbor act of 1899.	

## APPROPRIATIONS.

## For previous projects:

June 10, 1872.....	\$25,000.00
March 3, 1873.....	25,000.00
June 23, 1874.....	20,000.00
March 3, 1875.....	20,000.00
August 10, 1876.....	10,000.00
June 18, 1878.....	10,000.00
March 3, 1879.....	2,000.00
June 14, 1880.....	32,000.00
March 3, 1881.....	50,000.00
August 2, 1882.....	50,000.00
July 5, 1884.....	28,000.00
August 5, 1886.....	28,250.00
August 11, 1888.....	35,000.00
September 19, 1890.....	45,000.00
June 13, 1892.....	45,000.00
August 18, 1894.....	15,000.00
June 3, 1896.....	15,000.00
March 3, 1899.....	15,000.00
June 6, 1900 (allotment).....	10,000.00
June 6, 1900 (allotment).....	1,000.00

\$479,350.00

## For present project:

June 13, 1902.....	75,000.00
June 13, 1902 (allotment-maintenance).....	10,000.00
March 3, 1903.....	100,000.00
March 3, 1905.....	75,000.00
March 3, 1905.....	40,000.00
June 30, 1906.....	48,000.00
March 2, 1907.....	53,000.00
March 2, 1907.....	200,000.00

599,000.00

Total for both projects.....	1,078,350.00
June 30, 1907, received from sale of blueprints.....	27.10
Total.....	1,078,377.10
November 28, 1902, returned to Treasury.....	1,000.00
Balance.....	1,077,377.10

## CONTRACTS IN FORCE.

Name of contractor: Kirk, Driscoll &amp; Co.

Date of contract: March 1, 1904.

Date of approval: March 26, 1904.

Date of commencement: April 18, 1904.

Date of completion: September 6, 1905; time of completion waived.

Dredging about 500,000 cubic yards of material, at 15 cents per cubic yard, scow measurement, at a rate of not less than 30,000 cubic yards per month.

Contract completed November 26, 1906.

Name of contractors: P. Sanford Ross (incorporated).

Date of contract: November 12, 1904.

Date of approval: November 26, 1904.

Date of commencement: March 1, 1905.

Date of completion: April 9, 1908.

Dredging about 707,000 cubic yards of material, at 19.8 cents per cubic yard, scow measurement, at a rate of not less than 25,000 cubic yards per month.

# 1046 REPORT OF THE CHIEF OF ENGINEERS, U. S. ARMY.

Name of contractors: John and Joseph McSpirt.

Date of contract: October 23, 1906.

Date of approval: October 30, 1906.

Date of commencement: November 17, 1906.

Date of completion: October 16, 1907.

Dredging to the amount of about \$18,000, at 75 cents per cubic yard, scow measurement, for mud, sand, and gravel, and \$7.50 per cubic yard, solid measurement, for bowlders each one-third cubic yard in size or over.

Name of contractor: The International Contracting Co.

Date of contract: November 14, 1906.

Date of approval: November 20, 1906.

Date of commencement: March 1, 1907.

Date of completion: March 31, 1908.

Dredging 157,600 cubic yards of material, more or less, at 25 cents per cubic yard, scow measurement.

## COMMERCIAL STATISTICS.

### *Freight received and shipped by water, 1906.*

[Furnished by board of trade of the city of Newark, N. J.]

Articles.	Tons.	Estimated value.
Brick .....	269,974	\$1,767,394
Coal .....	244,966	646,619
Chemicals and colors .....	74,859	12,154,758
Cement, plaster, etc. ....	69,468	546,139
Grain .....	18,721	415,088
Fertilizers .....	69,704	1,560,602
General merchandise .....	305,245	108,191,200
Lumber .....	227,486	2,862,021
Oils .....	54,150	1,301,622
Ores and metals .....	153,489	28,447,330
Stone and sand .....	376,969	2,908,916
Miscellaneous .....	268,807	1,644,980
To and from the Hackensack River .....	485,350	4,368,236
<b>Total .....</b>	<b>2,577,188</b>	<b>167,113,306</b>

*Statement showing number of vessels of all kinds, by months, passing through the Passaic River drawbridge of the Central Railroad Company of New Jersey, for the year ending December 31, 1906.*

[Furnished by Mr. Joseph O. Osgood, chief engineer, Central Railroad Company of New Jersey.]

Month.	Steam-ers.	Schoon-ers.	Barges.	Sloops.	Cat-boats.	Rafts.	Total.
January .....	1,115	37	621	10	0	7	1,790
February .....	715	13	250	7	0	2	987
March .....	880	37	852	34	0	7	1,810
April .....	1,147	74	559	70	3	12	1,865
May .....	1,426	69	775	162	4	15	2,451
June .....	1,674	71	978	210	0	10	2,943
July .....	2,117	104	1,210	119	0	24	3,574
August .....	1,347	119	1,200	172	0	6	2,844
September .....	1,663	98	976	203	0	7	2,937
October .....	2,017	135	1,168	137	0	11	3,465
November .....	1,967	138	1,010	139	0	22	3,271
December .....	1,468	97	862	66	0	17	2,510
<b>Total .....</b>	<b>17,526</b>	<b>987</b>	<b>9,956</b>	<b>1,331</b>	<b>7</b>	<b>140</b>	<b>29,947</b>

The commerce is carried on in sail and steam vessels, canal boats, and barges, drawing from 4½ to 16 feet.

The following statement of commerce entered at the United States custom-house, port of Newark, has been furnished through the courtesy of the collector of customs, Newark, N. J.



*Vessels entered and cleared.*

	Foreign.		Domestic.		Tonnage tax collected.
	Entered.	Cleared.	Entered.	Cleared.	
Year ended June 30, 1906 .....	49	101	30	17	\$498.38
Ten months ended April 30, 1907 .....	57	70	12	8	494.31

*Value of exports.*

	Domestic.	Foreign.	Total.
Year ended June 30, 1906 .....	\$198,671	\$1,824,365	\$2,023,036
Ten months ended April 30, 1907 .....	95,568	1,133,473	1,229,031

*Value of imports.*

	Consumption.	Warehouse.	Total.
Year ended June 30, 1906 .....	\$119,562	\$3,406,484	\$3,600,956
Ten months ended April 30, 1907 .....	237,627	403,190	640,817

*Statement showing number of vessels of all kinds, by months, passing through the Hackensack River drawbridge of the Central Railroad Company of New Jersey, for the year ending December 31, 1906.*

[Furnished by Mr. Joseph O. Osgood, chief engineer, Central Railroad Company of New Jersey.]

Month.	Steamers.	Schooners.	Barges.	Sloops.	Cat-boats.	Rafts.	Total.
January .....	139	3	67	0	0	16	225
February .....	84	4	29	0	0	6	123
March .....	238	39	134	0	2	7	415
April .....	357	56	209	0	1	21	644
May .....	434	64	193	32	9	3	736
June .....	632	77	381	34	16	43	1,243
July .....	687	18	390	35	14	22	1,177
August .....	741	66	342	49	35	19	1,256
September .....	818	55	407	41	51	8	1,391
October .....	777	78	475	21	16	6	1,375
November .....	655	68	459	0	0	13	1,180
December .....	348	13	249	0	0	.....	623
Total .....	5,965	531	3,825	212	146	197	10,386

The commerce is carried on in sail and steam vessels, canal boats, and barges, drawing from 4½ to 16 feet.

The above vessels from the Passaic and Hackensack Rivers pass through Newark Bay, New Jersey.

EXTRACT FROM A LETTER OF MR. JAMES A. REILLY, SECRETARY OF THE BOARD OF TRADE OF NEWARK, N. J.

Since the improvement of two years ago, heavier tonnage has been received, with a proportionate lessening in the freight charges.

## G 2.

## IMPROVEMENT OF ARTHUR KILL, OR STATEN ISLAND SOUND, NEW YORK AND NEW JERSEY, AND CHANNEL BETWEEN STATEN ISLAND AND NEW JERSEY.

## (A) ARTHUR KILL, OR STATEN ISLAND SOUND.

Detailed descriptions of this waterway and the projects for its improvement are printed in the Annual Report of the Chief of Engineers for 1900, pages 178 and 1525 to 1530, and a condensed history is contained in current summary.

## OPERATIONS DURING THE PAST FISCAL YEAR.

At the close of the last fiscal year dredging was in progress, under contract of William H. Taylor, at which time a total of 1,349,283 cubic yards of material had been removed under the contract. No work is required under this contract during the winter seasons, between December 20 and March 1, but owing to the open winter dredging under contract was continued up to January 21, 1907, when work was suspended for the season. Dredging was resumed on March 22, and was in progress at the close of the fiscal year ending June 30, 1907.

The amount of material dredged during the fiscal year was 358,265 cubic yards, from which 83,612 cubic yards were deducted for over-depth dredging, leaving 274,653 cubic yards for the year to be credited under the contract. The material was mud, sand, gravel, and clay, and it was dumped at sea. During two months of the year two dredges have been employed and for nine months only one dredge. The amount and locations of work done during the year, as well as that done under the contract to date, are shown in the table, page 1049.

The total amount of material removed under this contract is 1,623,936 cubic yards. The total work accomplished consists, approximately, first, in dredging north and west of Staten Island, from the easterly end of the channel to be improved, connecting with Kill van Kull, for a length of about 3 miles, extending past Elizabethport to a point one-half mile below the Baltimore and Ohio Railroad bridge, with a width of from 150 to 300 feet; and in dredging at Chelsea Island (sec. 6 in table), an area of about 650 by 150 feet; and, second, in dredging at the lower end of the improvement at Storrs flats for a length of about 7,000 feet, with width of 300 feet. The latter has opened up a length of 7 miles of the Arthur Kill, from Perth Amboy to Carteret, to 21-foot navigation.

Nearly all of the work has been carried to the required depth of 21 feet at mean low water.

*Table showing progress of dredging in Arthur Kill upon contract in force, and parts of sections dredged and completed under the project of June 13, 1902, for a channel 300 feet wide and 21 feet deep at mean low water.*

Sectional description.			Estimated amount to be dredged from section.	Amount dredged in fiscal year ending June 30, 1907.	Total amount dredged under contract.	Proportion of sections completed.	Remarks.
Continuous.		Length in yards.					
Sec.	Location.						
1	Shooters Island to a point 600 feet east of Corner Stake light.	1,450	<i>Cu. yds.</i> 566,091	<i>Cu. yds.</i> .....	<i>Cu. yds.</i> 429,509	<i>Per cent.</i> 76	Dredged to width of 150 to 300 feet.
2	Thence to a point near Staten Island Ferry Slip, Elizabethport.	1,838	798,096	114,604	689,757	80	Do.
3	Thence to Baltimore and Ohio R. R. bridge.	1,350	324,667	.....	168,950	52	Do.
4	Thence to a point near wharf of National Transit Co.	1,100	218,866	71,146	71,146	82	Dredged to width of 150 feet.
5	Thence to a point 450 feet below Buckwheat Island.	988	72,282	.....	.....	.....	Section has required depth. Completed to 300 feet width.
6	Thence to center of Chelsea Island.	1,667	287,272	24,594	24,594	9	
7	Thence to a point 1,000 feet above Rahway River.	1,667	398,886	.....	.....	.....	
8	Thence to a point near Carteret.	1,667	290,964	.....	.....	.....	
9	Thence to a point near Fresh Kills.	1,667	305,708	.....	.....	.....	
10	Thence to a point near Port Reading.	3,000	None.	.....	.....	.....	Section has required depth. Completed to 300 feet width.
11	Thence to a point near Sewaren (Storrs flats).	2,388	282,751	64,309	289,980	100	
Total .....		18,667	3,585,000	274,653	1,628,986	.....	

Channel from Kill van Kull to section 1, length 600 yards, has required depth.  
Channel from section 11 to Raritan Bay, length 6,000 yards, has required depth.

### *Money statement.*

July 1, 1906, balance unexpended.....	\$175,217.92
Amount appropriated by sundry civil act approved March 4, 1907....	85,000.00
Received from sale of blueprints during the year.....	6.60
	<hr/> 260,224.52
June 30, 1907, amount expended during fiscal year, for works of improvement .....	35,931.39
July 1, 1907, balance unexpended.....	224,293.13
July 1, 1907, outstanding liabilities.....	36,638.01
July 1, 1907, balance available.....	<hr/> 187,655.12
July 1, 1907, amount covered by uncompleted contracts.....	282,837.49
Amount (estimated) required for completion of existing project.....	241,000.00
	<hr/>
{ Amount that can be profitably expended in fiscal year ending June 30, 1909, for works of improvement, in addition to the balance unexpended July 1, 1907.....	100,000.00
{ Submitted in compliance with requirements of sundry civil act of June 4, 1897.	

## APPROPRIATIONS.

June 13, 1902.....	\$100,000.00	June 30, 1907, received	
March 3, 1903.....	150,000.00	from sale of blueprints.....	\$6.60
March 3, 1905.....	70,000.00		
June 30, 1906.....	50,000.00	Total.....	455,006.60
March 4, 1907.....	85,000.00		

## CONTRACT IN FORCE.

Name of contractor: William H. Taylor.

Date of contract: October 14, 1903.

Date of approval: October 27, 1903.

Date of commencement: November 26, 1903.

Date of completion: Indefinite; dependent upon appropriations.

Dredging about 3,535,000 cubic yards of material at 14.8 cents per cubic yard scow measurement.

## COMMERCIAL STATISTICS.

*Freight received and shipped by water, 1906.*

[Statement by the Hon. Peter Bonnett, chairman of the Joint Waterways Committee.]

Articles.	Tons.	Estimated value.
Coal.....	6,812,045	\$24,884,376
Clay products.....	363,890	2,632,638
Building materials.....	1,180,097	7,856,541
Ores and metals.....	433,481	90,084,011
Chemicals and fertilizers.....	372,891	6,280,109
Oils.....	45,786	1,308,082
Machinery and manufactures.....	226,030	14,637,995
General merchandise.....	1,815,996	116,621,056
Barrels.....	2,910	37,830
Crude asphalt.....	38,839	407,809
Gulf pitch.....	9,360	130,900
Other materials.....	19,179	71,250
Refined asphalt.....	14,150	283,000
Asphalt block.....	12,000	107,800
Total.....	11,386,594	265,201,897
The following commerce of Raritan Bay and its tributaries also pass through the Arthur Kill, amounting to.....	5,188,246	90,377,920
Total.....	16,574,840	355,579,817

*Vessels engaged in above commerce.*

Class.	Number of trips.	Draft when loaded.	Tonnage.
Steamers.....	11,893	<i>Feet.</i> 5½ to 22	20 to 2,200
Sail vessels.....	19,965	5 to 16	30 to 2,000
Barges, etc.....	81,078	5 to 12	75 to 500
Power boats, etc.....	100,000	1 to 6	1 to 25
Total.....	212,936		

## (B) CHANNEL BETWEEN STATEN ISLAND AND NEW JERSEY, NEW YORK AND NEW JERSEY.

Detailed descriptions of this waterway and of the projects for its improvement are printed in the Annual Report of the Chief of Engineers for 1897, pages 1130 to 1132, and a condensed history is contained in the current summary.

## OPERATIONS DURING THE PAST FISCAL YEAR.

At the close of the last fiscal year dredging was in progress under contract with P. Sanford Ross (Incorporated), and 81,781 cubic yards of material had been removed. Dredging was continued until July 6, when the plant was withdrawn. An examination of the dredged area showed several shoals requiring removal. The contractor was notified accordingly, and dredging was resumed on July 31 and continued to August 18, when the contract was completed.

The amount of material removed during the fiscal year was 14,758 cubic yards, and the total amount under the contract 96,539 cubic yards. From this was deducted 11,607 cubic yards for overdepth and 909 cubic yards for illegal dumping, leaving the total final estimate under the contract 84,023 cubic yards.

The material was partly dumped at sea in the public dumping grounds and partly near the shore on the west side of Newark Bay, whence it was pumped ashore on marsh lands of contractor.

The work of the fiscal year, together with that of 1906, has restored the channel around Corner Stake Light, connecting Arthur Kill and Kill van Kull to its projected dimensions, namely, 400 feet wide and 14 feet deep at mean low water.

*Money statement.*

July 1, 1906, balance unexpended.....	\$11,384.92
June 30, 1907, amount expended during fiscal year, for maintenance of improvement.....	8,681.36
July 1, 1907, balance unexpended.....	2,703.56
<hr/>	
{ Amount that can be profitably expended in fiscal year ending June 30, 1909, for maintenance of improvement, in addition to the balance unexpended July 1, 1907.....	
{ Submitted in compliance with requirements of sundry civil act of June 4, 1897, and of section 7 of the river and harbor act of 1899.	
	20,000.00

## APPROPRIATIONS.

June 23, 1874.....	\$50,000	July 13, 1892 <sup>a</sup> .....	\$5,000
August 14, 1876.....	10,000	July 13, 1892.....	15,000
June 18, 1878.....	15,000	August 18, 1894 <sup>a</sup> .....	4,500
June 14, 1880.....	29,000	August 18, 1894.....	6,000
August 2, 1882.....	40,000	June 3, 1896 <sup>b</sup> .....	13,000
July 5, 1884.....	10,000	March 3, 1899.....	32,000
August 5, 1886.....	15,000	June 13, 1902 <sup>b</sup> .....	10,000
August 11, 1888 <sup>a</sup> .....	10,000	March 3, 1905.....	10,000
August 11, 1888.....	15,000		
September 19, 1890 <sup>a</sup> .....	7,000	Total.....	311,500
September 19, 1890.....	15,000		

<sup>a</sup> Appropriation for Improving Arthur Kill, New York and New Jersey—removal of Steep Point.

<sup>b</sup> Includes \$5,000 for Lemon Creek.

## ABSTRACT OF CONTRACT IN FORCE.

Name of contractor: P. Sanford Ross (Incorporated).  
 Date of contract: November 15, 1905.  
 Date of approval: November 27, 1905.  
 Date of commencement: March 1, 1906.  
 Date of completion: June 30, 1906; time of completion waived.  
 Dredging about 94,637 cubic yards of material, at 15.85 cents per cubic yard, scow measurement.  
 Contract completed August 18, 1906.

## COMMERCIAL STATISTICS.

*Freight received and shipped by water, 1906.*

This commerce includes that of Arthur Kill or Staten Island Sound, part of Raritan Bay and its tributaries, and 25 per cent of the Passaic River, and amounts to 17,097,799 tons at an estimated value of \$396,266,084.

## LEMON CREEK.

No statistics have been received since 1904. At that time the commerce consisted of oysters, coal, and building materials, valued at \$388,000. The value of the vessels engaged in the same was \$275,000. The draft of these vessels was from 3½ to 6 feet and averaging from 4 to 200 tons capacity.

## G 3.

## IMPROVEMENT OF WOODBRIDGE CREEK, NEW JERSEY.

Detailed descriptions of this creek and of the projects for its improvement are printed in the Annual Report of the Chief of Engineers for 1900, page 1552, and a condensed history is contained in the current summary.

## OPERATIONS DURING THE PAST FISCAL YEAR.

At the close of the last fiscal year under appropriation of \$6,000, made by the river and harbor act approved March 3, 1905, and in accordance with the project approved May 26, 1905, for expenditure of same in dredging for continuing improvement and maintenance, a contract, dated January 11, 1906, had been entered into with A. C. Driscoll for dredging about 16,129 cubic yards of material at the rate of 31 cents per cubic yard.

Dredging under this contract was commenced on July 2 and completed September 7, 1906. The total amount of material removed was 16,389 cubic yards, from which was deducted 850 cubic yards for overdepth dredging, leaving a balance of 15,539 cubic yards. The work accomplished consisted in dredging a channel 50 feet wide and 4,250 feet long from the Arthur Kill to a point 700 feet above the New York and Long Branch Railroad bridge, and a cut 25 feet wide and 75 feet in length above this point. Six hundred feet of this reach had the required depth and was not dredged.

The mouth of this channel is 700 feet below the inner corner of Boynton's dock. The depth made was from 8 to 9 feet at mean low water. The dredged material was disposed of by pumping it ashore on land of Mr. Boynton near the mouth of the creek.

By the river and harbor act of March 2, 1907, an appropriation of \$19,000 was made for this work. Project for expenditure was submitted on March 18 and approved March 22, 1907. It provides for dredging, for completing improvement, and for maintenance under the appropriation and former balances.

Specifications for dredging in accordance with the approved project were prepared and the work was advertised on June 27, proposals to be opened on July 27, 1907.

### *Money statement.*

July 1, 1906, balance unexpended.....	\$5, 766. 10
Amount appropriated by river and harbor act approved March 2, 1907.....	19, 000. 00
	<hr/> 24, 766. 10
June 30, 1907, amount expended during fiscal year, for works of improvement.....	5, 322. 70
July 1, 1907, balance unexpended.....	19, 443. 40
July 1, 1907, outstanding liabilities.....	16. 50
	<hr/> 19, 426. 90
<hr/>	
{ Amount that can be profitably expended in fiscal year ending June 30, 1909, for maintenance of improvement, in addition to the balance unexpended July 1, 1907.....	6, 000. 00
{ Submitted in compliance with requirements of sundry civil act of June 4, 1897, and of section 7 of the river and harbor act of 1899.	

### APPROPRIATIONS.

For previous project:	
March 3, 1879.....	\$4, 000
June 14, 1880.....	5, 000
March 3, 1881.....	5, 000
August 2, 1882.....	5, 000
	<hr/> \$19, 000
For present project:	
June 13, 1902.....	\$10, 000
April 28, 1904 (allotment for survey).....	250
April 28, 1904 (allotment).....	7, 500
March 3, 1905.....	6, 000
March 2, 1907.....	19, 000
	<hr/> 42, 750
Total for both projects.....	61, 750

### CONTRACT IN FORCE.

Name of contractor: Ambrose C. Driscoll.

Date of contract: January 11, 1906.

Date of approval: January 12, 1906.

Date of commencement: June 1, 1906.

Date of completion: August 31, 1906; time of completion waived.

Dredging about 16,129 cubic yards of material, at 31 cents per cubic yard, scow measurement. Contract was completed on September 7, 1906.

# 1054 REPORT OF THE CHIEF OF ENGINEERS, U. S. ARMY.

## COMMERCIAL STATISTICS.

### *Freight received and shipped by water, 1906.*

[Statement by merchants located on creek.]

Articles.	Tons.	Estimated value.
<b>Received:</b>		
Tin scrap .....	17,000	\$350,000
Coal .....	30,000	94,000
Clay .....	20,000	50,000
Sawdust .....	4,000	4,000
<b>Shipped:</b>		
Steel scrap .....	14,500	220,000
Fire brick and clay products .....	55,299	337,395
Clay .....	24,410	58,172
Fireproofing .....	2,115	13,000
Drain tile .....	68	680
<b>Total .....</b>	<b>167,392</b>	<b>1,128,237</b>

### *Vessels engaged in above commerce.*

Class.	Number of trips.	Draft when loaded.	Tonnage.
		<i>Feet.</i>	
Steamers .....	614	5 to 10	118 to 150
Sail vessels .....	415	5 to 11	25 to 340
Barges, etc .....	517	5 to 10	100 to 500
<b>Total .....</b>	<b>1,546</b>		

#### EXTRACT FROM A LETTER OF HENRY MAURER & SON, MAURER, N. J.

The improvements thus far made in Woodbridge Creek have been beneficial to all the industries located thereon, as the deepening of the channel allows egress and ingress for vessels of deeper draft. As there yet remains, however, considerable more to be done to make a uniform depth throughout its entire length, it would seem to us that the work should by all means be continued so as to protect what has been done in addition to what yet needs to be done. Woodbridge Creek is quite an important waterway, and being an inland stream, sediment accumulates rapidly and shoals the depth of water very materially yearly; hence the necessity for annual attention.

#### EXTRACT FROM A LETTER OF MR. JAMES E. BERRY, WOODBRIDGE, N. J.

There has been a considerable increase in the commerce of Woodbridge Creek on account of the improvements made, and I have no doubt that a continuance of the work would in time increase the commerce and reduce the freight rates.

## G 4.

### IMPROVEMENT OF RARITAN BAY, NEW JERSEY.

Detailed description of this bay and of the projects for its improvement are printed in the Annual Report of the Chief of Engineers for 1897, pages 1142 and 1143, and a condensed history is contained in the current summary.

#### OPERATIONS DURING THE PAST FISCAL YEAR.

At the close of the last fiscal year under appropriation of \$50,000 for dredging made by the river and harbor act, approved March 3,



1905, and in accordance with project for its expenditure approved April 28, 1905, dredging was in progress for maintenance of channels under contract with P. Sanford Ross (Incorporated), dated October 18, 1905, for the removal of about 252,366 cubic yards of material at 15.85 cents per cubic yard, and 150,161 cubic yards had been dredged for the South Amboy channel.

Dredging under the contract was continued to September 8, 1906, when it was suspended pending adjustment of the question of over-depth dredging. It was resumed on April 26 and completed on June 8, 1907. The total amount of material removed during the fiscal year was 169,365 cubic yards, and the total amount under the contract 319,526 cubic yards. A deduction of 67,804 cubic yards for overdepth dredging was made, leaving a balance for the fiscal year of 101,561 cubic yards and 251,722 cubic yards for the entire contract.

The work of the fiscal year, together with that reported for 1906, has sufficed to restore the South Amboy channel to full projected dimensions and the Seguine Point and Wards Point channels to practically projected dimensions. Project for expenditure of the appropriation of \$25,000, act of March 2, 1907, was approved on March 21, 1907. It provides for dredging for maintenance, and also for making an examination of the three channels upon which to base further work, at an estimated cost of \$1,000. The examination has been made and platting of same is in progress.

#### *Money statement.*

July 1, 1906, balance unexpended.....	\$34, 134. 12
Amount appropriated by river and harbor act approved March 2, 1907.....	25, 000. 00
September 29, 1907, refundment of overpayment.....	. 20
	<hr/>
June 30, 1907, amount expended during fiscal year, for maintenance of improvement.....	59, 134. 32
	<hr/>
June 30, 1907, amount expended during fiscal year, for maintenance of improvement.....	26, 639. 94
July 1, 1907, balance unexpended.....	<hr/>
July 1, 1907, outstanding liabilities.....	32, 494. 38
	<hr/>
July 1, 1907, outstanding liabilities.....	4, 645. 98
July 1, 1907, balance available.....	<hr/>
	27, 848. 40
	<hr/>
{ Amount that can be profitably expended in fiscal year ending June 30, 1909, for maintenance of improvement, in addition to the balance unexpended July 1, 1907.....	
{ Submitted in compliance with requirements of sundry civil act of June 4, 1897, and of section 7 of the river and harbor act of 1890.	
	20, 000. 00

#### APPROPRIATIONS.

March 3, 1881.....	\$50, 000. 00	June 13, 1902.....	\$45, 000. 00
August 2, 1882.....	50, 000. 00	March 3, 1905.....	50, 000. 00
July 5, 1884.....	20, 000. 00	March 2, 1907.....	25, 000. 00
August 5, 1886.....	37, 500. 00		<hr/>
August 11, 1888.....	25, 000. 00	Total.....	562, 500. 00
September 19, 1890.....	40, 000. 00	September 29, 1907, refundment of overpayment.....	. 20
July 13, 1892.....	40, 000. 00		<hr/>
August 18, 1894.....	40, 000. 00	Total.....	562, 500. 20
June 3, 1896.....	75, 000. 00		
March 3, 1899.....	65, 000. 00		

## CONTRACT IN FORCE.

Name of contractor: P. Sanford Ross (Incorporated).  
 Date of contract: October 19, 1905.  
 Date of approval: November 7, 1905.  
 Date of commencement: November 28, 1905.  
 Date of completion: October 27, 1906; time of completion waived.  
 Dredging about 252,366 cubic feet of material, at 15.85 cents per cubic yard,  
 scow measurement. Contract was completed on June 8, 1907.

## COMMERCIAL STATISTICS.

*Freight received and shipped by water, 1906.*

[Statement furnished through the courtesy of the Hon. D. C. Chase; the collector of customs of the port of Perth Amboy, N. J., and merchants located on the bay.]

Articles.	Tons.	Estimated value.
<b>Received:</b>		
Scrap iron.....	22	
Scrap steel.....	65	
Wire rods.....	114	
Iron ore.....	606	
Licorice root.....	787	
Powder.....	8	\$81,580
Piles.....	94	
Railroad ties.....	182	
Lumber.....	2,518	
Hemlock boards and planks.....	350	
Plaster rock.....	1,000	5,000
Phosphate rock.....	2,500	7,500
Bullion.....	54,000	43,000,000
Asphalt.....	40,500	119,475
Refined lead and copper.....	50,000	20,000,000
Coal.....	4,682,265	16,212,927
Sand.....	11,896	11,896
Clay.....	4,261	5,325
Stone.....	579	1,158
Iron water pipe.....	11,540	577,000
<b>Total.....</b>	<b>4,818,225</b>	<b>80,021,811</b>
Commerce of South River, Raritan River, Cheesapeake Creek, Matawan Creek, Keyport Harbor, and a small per cent from the Arthur Kill, that passes through Raritan Bay.....	1,619,020	84,386,799
<b>Total.....</b>	<b>6,432,245</b>	<b>114,358,610</b>

*Vessels engaged in above commerce.*

Class.	Number of trips.	Draft when loaded.	Tonnage.
		<i>Feet.</i>	
Steamers.....	4,353	5½ to 22	20 to 2,200
Sail vessels.....	6,334	5 to 21	30 to 2,000
Barges, etc.....	30,353	5 to 10	75 to 500
Power boats, yachts, etc.....	75,000	1 to 6	1 to 25
<b>Total.....</b>	<b>116,040</b>		

## G 5.

IMPROVEMENT OF KEYPORT HARBOR, MATAWAN CREEK, RARITAN, SOUTH, AND ELIZABETH RIVERS, SHOAL HARBOR AND COMPTON CREEK, AND CHEESEQUAKE CREEK, NEW JERSEY.

## (A) KEYPORT HARBOR.

Detailed descriptions of this harbor and of the project for its improvement are printed in the Annual Report of the Chief of Engi-

neers for 1897, pages 1147 to 1149, and a condensed history is contained in the current summary.

#### OPERATIONS DURING THE PAST FISCAL YEAR.

Project for expenditure of unexpended balance of \$1,294.03 and an allotment of \$8,705.97 from the consolidated appropriation, act of March 2, 1907, was approved on March 22. It provided for dredging for maintenance of channel. Under advertisement of April 26, proposals for dredging were opened on May 27, 1907, and the bid of J. M. Briggs, New York City, at 40 cents per cubic yard, scow measurement, the only one received, was accepted, and a contract dated June 20 and approved June 29, 1907, was entered into for the removal of about 20,000 cubic yards of material at the price named. At the close of the fiscal year work had not been begun under this contract.

The expenditures during the year were \$1,365.49 in payment for dredging under contract completed during the previous year and \$67.80 for contingencies during the past year.

#### Money statement.

July 1, 1906, balance unexpended.....	\$2, 659. 52
Amount appropriated by river and harbor act approved March 2, 1907..	8, 705. 97
	<hr/> 11,365. 49
June 30, 1907, amount expended during fiscal year, for maintenance of improvements.....	1, 433. 29
July 1, 1907, balance unexpended..	9, 932. 20
July 1, 1907, outstanding liabilities.....	45. 00
	<hr/> 9, 887. 20
July 1, 1907, balance available.....	8, 000. 00
July 1, 1907, amount covered by uncompleted contracts.....	9, 975. 00
Amount (estimated) required for completion of existing project.....	<hr/> 19, 975. 00
{ Amount that can be profitably expended in fiscal year ending June 30, 1909, in addition to the balance unexpended July 1, 1907:	
For works of improvement.....	\$9, 975. 00
For maintenance of improvement.....	10, 000. 00
	<hr/> 19, 975. 00
Submitted in compliance with requirements of sundry civil act of June 4, 1897, and of section 7 of the river and harbor act of 1899.	

#### APPROPRIATIONS.

August 2, 1882 .....	\$30, 475. 00	June 13, 1902 (allotment-maintenance) .....	\$5, 000. 00
July 13, 1892 .....	5, 000. 00	March 3, 1905 (allotment) ..	5, 000. 00
August 18, 1894 .....	5, 000. 00	March 2, 1907 (allotment) ..	8, 705. 97
June 3, 1896 .....	2, 500. 00		
March 3, 1899 .....	2, 500. 00		
June 13, 1902 (allotment) ..	5, 000. 00	Total .....	69, 180. 97

## CONTRACT IN FORCE.

Name of contractor: J. M. Briggs.  
 Date of contract: June 20, 1907.  
 Date of approval: June 29, 1907.  
 Date of commencement: Not determined.  
 Date of completion: Within three months from commencement.  
 Dredging about 20,000 cubic yards of material, at 40 cents per cubic yard, scow measurement.

## COMMERCIAL STATISTICS.

*Freight received and shipped by water, 1906.*

[Statement by the New York and New Jersey Steamboat Company, the New Jersey Company, and merchants located on the harbor.]

Articles.	Tons.	Estimated value.
<b>Received:</b>		
General merchandise.....	17,000	\$700,000
Manure and fertiliser.....	10,000	32,000
Coke, coal, lumber, and sawdust.....	18,600	184,750
Oysters.....	6,000	165,000
<b>Shipped:</b>		
Farm produce.....	25,875	1,027,000
Oysters.....	3,000	89,500
Clay products.....	3,321	41,606
Fish and shellfish.....	12,000	120,000
Salt hay.....	400	8,200
<b>Total.....</b>	<b>101,196</b>	<b>2,356,556</b>
Commerce from Matawan Creek that passes through Keyport Harbor.....	123,181	717,506
<b>Total.....</b>	<b>229,377</b>	<b>3,074,060</b>

*Vessels engaged in above commerce.*

Class.	Trips.	Draft when loaded.	Tonnage.
<b>Steamers.....</b>	<b>1,754</b>	<i>Feet.</i> <b>54 to 9</b>	<b>20 to 500</b>
Sail vessels.....	859	4 to 13	20 to 300
Barges, etc.....	562	4 to 7	100 to 500
Power boats and yachts.....	20,000	1 to 6	1 to 25
<b>Total.....</b>	<b>22,675</b>		

## EXTRACT FROM A LETTER OF MR. E. D. DU BOIS, KEYPORT, N. J.

I have been chairman of a committee of citizens of Keyport, N. J., who are endeavoring to secure a passenger steamboat line from this place to New York City. Upon inquiry I find that it would be necessary for us to put in service a boat with a draft of not to exceed 5 feet and 6 inches, and inasmuch as this requirement was made on account of the channel at this port, I found it a very difficult proposition to secure a vessel that could land at this port. I have also learned that the channel is gradually filling for the want of attention.

Keyport Harbor a few years ago enjoyed an immense freight business, on account of the difference in rates between the charges of the railroad companies, but on account of the dock facilities being inadequate a company was formed and a dock built and boat chartered; after all arrangements had been made it was found that the channel at the new dock was such that the boat could not leave this port, except at high tide; the consequence being that the old company bought and monopolized the investment and efforts of our local people, who were located within a radius of 6 miles from the Keyport dock, resulting in an elimination of competition from this port to the markets in New York. From statistics you may learn that the territory which I have above mentioned is one of the greatest truck-growing territories in this part of the State, and, I might add, that for potatoes, hay, corn, and other cereals we have a port that can command freight within a radius of 15 miles; also that our location on Raritan Bay

is such that with adequate passenger steamboat service we can command the attention and patronage of Greater New York, the population of which (as you probably know) is increasing at the rate of 400 per day.

The usual charges for transportation from New York to Keyport by boat is 30 cents for a single trip and 50 cents for the round trip. The railroad rates are 75 cents for a single trip and \$1.25 for the round trip. (These railroad rates are given from Matawan Station to New York, and do not include the fare on the trolley.)

### (B) MATAWAN CREEK.

Detailed description of this creek and of the project for its improvement are printed in the Annual Report of the Chief of Engineers for 1897, page 1145, and a condensed history is contained in the current summary.

#### OPERATIONS DURING THE PAST FISCAL YEAR.

Project for expenditure of an allotment of \$6,000 from the consolidated appropriation, act of March 2, 1907, was approved on March 22. It provided for dredging for maintenance of channel. Under advertisement of April 26 proposals for dredging were opened on May 27, 1907, and the bid of J. M. Briggs, New York City, at 60 cents per cubic yard, scow measurement, the only one received, was accepted, and a contract dated June 20, approved on June 29, 1907, was entered into for the removal of about 8,333 cubic yards of material at the price named. At the close of the fiscal year work had not been begun under this contract.

#### *Money statement.*

Amount appropriated by river and harbor act approved March 2, 1907.	\$6,000.00
June 30, 1907, amount expended during fiscal year, for maintenance of improvement .....	4.40
July 1, 1907, balance unexpended .....	5,995.60
July 1, 1907, amount covered by uncompleted contracts .....	5,000.00
Amount (estimated) required for completion of existing project .....	12,120.00
Amount that can be profitably expended in fiscal year ending June 30, 1909, in addition to the balance unexpended July 1, 1907:	
For works of improvement .....	\$12,120.00
For maintenance of improvement .....	6,000.00
	18,120.00
Submitted in compliance with requirements of sundry civil act of June 4, 1897, and of section 7 of the river and harbor act of 1899.	

#### APPROPRIATIONS.

March 3, 1881 .....	\$15,000.00	March 3, 1905 (allotment) ..	\$3,000.00
August 2, 1882 .....	6,000.00	March 2, 1907 .....	6,000.00
September 19, 1890 .....	2,500.00		
July 13, 1892 .....	9,620.00	Total .....	57,120.00
August 18, 1894 .....	3,000.00	January 3, 1905, returned	
June 3, 1896 .....	3,000.00	to Treasury .....	315.61
March 3, 1899 .....	3,000.00		
June 13, 1902 (allotment) ..	3,000.00	Balance .....	56,804.39
June 13, 1902 (allotment-maintenance) ..	3,000.00		

## CONTRACT IN FORCE.

Name of contractor: J. M. Briggs.  
 Date of contract: June 20, 1907.  
 Date of approval: June 29, 1907.  
 Date of commencement: Not determined.  
 Date of completion: Within two months from commencement.  
 Dredging about 8,333 cubic yards of material at 60 cents per cubic yard, scow measurement.

## COMMERCIAL STATISTICS.

*Freight received and shipped by water, 1906.*

[Statements furnished by the New York and New Jersey Steamboat Company, the New Jersey Company, and Mr. Judson Conover.]

Articles.	Tons.	Estimated value.
<b>Received:</b>		
Coal, sawdust, and coke .....	19,300	\$75,000
Manure .....	15,000	22,250
Fertilizers .....	14,000	21,000
Shell lime .....	7,500	15,000
<b>Shipped:</b>		
Farm produce .....	3,710	148,400
Brick and fireproofing .....	47,500	330,000
Clay products .....	21,171	105,855
<b>Total.....</b>	<b>128,181</b>	<b>717,505</b>

*Vessels engaged in above commerce.*

Class.	Number of trips.	Draft when loaded.	Tonnage.
		<i>Feet.</i>	
Steamers .....	439	5½ to 8	20 to 250
Sail vessels .....	243	5½ to 8	60 to 200
Barges, etc .....	344	4 to 8	250 to 500
<b>Total .....</b>	<b>1,026</b>		

## EXTRACT FROM A LETTER RECEIVED FROM MR. H. B. WELLS, SUPERINTENDENT OF THE NEW JERSEY COMPANY, MATAWAN, N. J.

We beg to advise that the continuance of improvements on Matawan Creek has reduced our freight rates 50 per cent. Should the improvements on Matawan Creek be ceased, we would be compelled to haul our material to the freight station at Matawan, as we have no railroad spur at our works.

The sand bar at the mouth of the creek which empties into the Raritan Bay at Keyport has been quite a hindrance to us during the past six months, as days when the tide was not very high the boats were unable either to come in or go out of the creek, thus causing a delay to the shipment of our material.

## (c) RARITAN RIVER.

Detailed descriptions of this river and of the projects for its improvement, and revised estimates for its completion, are printed in the Annual Reports of the Chief of Engineers for 1897, pages 1136 to 1139, and for 1900, page 1505, respectively, and a condensed history is contained in current summary.

## OPERATIONS DURING THE PAST FISCAL YEAR.

At the close of the last fiscal year, under allotment of \$22,000 from consolidated appropriation, act of March 3, 1905, and in accordance with project for its expenditure approved August 17, 1905, dredging was in progress under contract with The International Contracting Company, dated November 15, 1905, for the removal of about 72,000 cubic yards of material, and 67,498 cubic yards had been dredged. Dredging was continued until July 27, upon which date the contract was completed.

The plant used and the method of disposing of material are described in the Annual Report of the Chief of Engineers for 1906, page 1006. The amount of material removed during the fiscal year was 15,049 cubic yards, and the work accomplished consisted in restoring the south channel for a length of 1,200 feet, with width of 60 feet, and in removing shoals at "Mrs. Ellis's Grave" and Bishops Point, over areas previously dredged under contract, and a few additional shoals.

The amount of material credited to the contractor for this month's work was 2,918 cubic yards. Twelve thousand one hundred and thirty-one cubic yards were deducted from the estimate for overdepth dredging throughout the contract.

The total amount of material removed and the total work accomplished under the contract was as follows:

Location.	Re- moved.	Areas dredged.	Depth.
	<i>Cu. yds.</i>	<i>Feet.</i>	<i>Feet.</i>
Mrs. Ellis's Grave .....	8,197	700 by 100	10
Bishops Point .....	6,482	1,000 by 100	10
The Stakes .....	6,828	565 by 80	10 to 12
Middle Grounds .....	18,310	1,500 by 80	10 to 12
South channel, Middle Grounds .....	42,735	600 by 80 4,500 by 60	6 to 7
Total .....	82,547		
For overdepth .....	12,181		
Total under contract .....	70,416		

Under agreement with the Middlesex Transportation Company, from whom the complaint was received, and by approval of the Chief of Engineers, dated June 13, 1907, \$50 was expended for the removal of a large trunk of a tree which had lodged on the side of the channel opposite Martin's dock. It was removed on June 23, 1907, and was deposited on the dock of the Middlesex Transportation Company at New Brunswick, N. J.

Projects for expenditure of unexpended balance of \$3,024.58 and an allotment of \$16,975.42 from the consolidated appropriation, act of March 2, 1907, was approved on March 22. It provided for dredging for maintenance of channel. Under advertisement of April 26, proposals for dredging were opened on May 27, 1907, and the bid of J. M. Briggs, New York City, at 40 cents per cubic yard, scow measurement, the only one received, was accepted, and a contract, dated June 20, and approved June 29, 1907, was entered into for the

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removal of about 40,000 cubic yards of material at the price named. At the close of the fiscal year work had not been begun under this contract.

## Money statement.

July 1, 1906, balance unexpended.....	\$14,623.52
Amount appropriated by river and harbor act approved March 2, 1907..	16,975.42
	<hr/> 31,598.94
June 30, 1907, amount expended during fiscal year, for maintenance of improvement.....	11,766.13
July 1, 1907, balance unexpended.....	19,832.81
July 1, 1907, outstanding liabilities.....	337.96
	<hr/> 19,494.85
July 1, 1907, amount covered by uncompleted contracts.....	16,000.00
Amount (estimated) required for completion of existing project....	373,392.68
	<hr/> <hr/>
{ Amount that can be profitably expended in fiscal year ending June 30, 1909, in addition to the balance unexpended July 1, 1907:	
For works of improvement.....	\$50,000.00
For maintenance of improvement.....	20,000.00
	<hr/> 70,000.00
{ Submitted in compliance with requirements of sundry civil act of June 4, 1897, and of section 7, of the river and harbor act of 1899.	

## APPROPRIATIONS.

June 18, 1878.....	\$200,000.00	June 3, 1896.....	\$20,000.00
March 3, 1879.....	60,000.00	March 3, 1899.....	20,000.00
June 14, 1880.....	100,000.00	June 13, 1902 (allotment) ..	20,000.00
March 3, 1881.....	25,000.00	March 3, 1905 (allotment) ..	22,000.00
August 2, 1882.....	25,000.00	March 2, 1907 (allotment) ..	16,975.42
July 5, 1884.....	35,000.00		
August 5, 1886.....	26,250.00	Total.....	730,225.42
August 11, 1888.....	50,000.00	December 16, 1904, received from sale of condemned property .....	1.15
September 19, 1890.....	50,000.00		
July 13, 1892.....	40,000.00		
August 18, 1894.....	20,000.00		

## CONTRACTS IN FORCE.

Name of contractor: The International Contracting Company.

Date of contract: November 15, 1905.

Date of approval: November 27, 1905.

Date of commencement: March 1, 1906.

Date of completion: September 30, 1906.

Dredging about 72,000 cubic yards of material, at 25 cents per cubic yard scow measurement. Contract completed on July 27, 1906.

Name of contractor: J. M. Briggs.

Date of contract: June 20, 1907.

Date of approval: June 29, 1907.

Date of commencement: Not determined.

Date of completion: Within five months from commencement.

Dredging about 40,000 cubic yards of material, at 40 cents per cubic yard, scow measurement.



## COMMERCIAL STATISTICS.

*Freight received and shipped by water, 1906.*

[Statement furnished by courtesy of the Hon. D. C. Chase and merchants located on the river.]

Articles.	Tons.	Estimated value.
Forest products .....	14,908	\$3,804,476
Mine and quarry products .....	32,768	
Animal products .....	326	
Agricultural products .....	227	
Manufactures .....	41,620	
Merchandise and miscellaneous .....	49,131	5,128,899
Coal .....	87,662	
Copper bars, etc., containing gold and silver .....	12,798	
Refined copper .....	15,647	
Bricks .....	151,791	
Fireproofing and conduits .....	158,782	768,910
Total .....	510,439	16,405,095
Commerce of South River that passes through the Raritan River .....	226,227	972,550
Total .....	736,666	17,377,645

*Vessels engaged in above commerce.*

Class.	Trips.	Draft when loaded.	Tonnage.
		<i>Fect.</i>	
Steamers .....	875	9	45 to 92
Sail vessels .....	1,720	6 to 9	30 to 50
Barges, etc. ....	2,193	6 to 9	60 to 300
Rafts, pile drivers .....	160		
Total .....	4,948		
Vessels engaged in the commerce of South River .....	1,221		
Total .....	6,169		

EXTRACT FROM A LETTER RECEIVED FROM MR. JAMES C. BOSSI, GENERAL SUPERINTENDENT OF THE NATIONAL FIREPROOFING COMPANY, PERTH AMBOY, N. J.

There is no doubt that the improvements to the Raritan River have proved a great benefit to all the works fronting on same. The improved navigation has been instrumental to lower freight rates. The principal result of these improvements is that the attention of industrials has been called to the Raritan River as a suitable place to establish new works.

## (D) SOUTH RIVER.

Detailed description of this river and of the projects for its improvement are printed in the Annual Report of the Chief of Engineers for 1897, page 1139, and a condensed history is contained in the current summary.

## OPERATIONS DURING THE PAST FISCAL YEAR.

Project for expenditure of unexpended balance of \$4,651.15 and allotment of \$13,178.63 from the consolidated appropriation, act of March 2, 1907, and remaining balances, was approved on March 22. It provided for dredging for continuing the improvement and main-

tenance of channel. Under advertisement of April 26, proposals for dredging were opened on May 27, 1907, and the bid of Hawley Miller, Albany, N. Y., at 32 cents per cubic yard, scow measurement, the lower of two received, was accepted, and a contract dated June 18, approved June 26, 1907, was entered into for the removal of about 43,750 cubic yards of material at the price named.

At the close of the fiscal year work had not been begun under this contract.

A description of the last work done is contained in the Annual Report of the Chief of Engineers for 1904, page 1148.

Details as to the progress made in carrying out this project may be found in the Annual Reports of the Chief of Engineers for 1900, page 181, and for 1901, page 1237.

#### *Money statement.*

July 1, 1906, balance unexpended.....	\$4,867. 12
Amount appropriated by river and harbor act approved March 2, 1907.....	13, 178. 63
	18, 045. 75
June 30, 1907, amount expended during fiscal year, for maintenance of improvement.....	290. 79
July 1, 1907, balance unexpended.....	17, 754. 96
July 1, 1907, outstanding liabilities.....	57. 08
July 1, 1907, balance available.....	17, 697. 88
July 1, 1907, amount covered by uncompleted contracts.....	14, 000. 00
Amount (estimated) required for completion of existing project.....	88, 695. 00
Amount that can be profitably expended in fiscal year ending June 30, 1909, in addition to the balance unexpended July 1, 1907:	
For works of improvement.....	\$88, 695. 00
For maintenance of improvement.....	10, 000. 00
	98, 695. 00
Submitted in compliance with requirements of sundry civil act of June 4, 1897, and of section 7 of the river and harbor act of 1899.	

#### APPROPRIATIONS.

For previous project:	
March 3, 1871.....	\$15, 000. 00
March 3, 1873.....	5, 000. 00
	\$20, 006. 00
For present project:	
June 14, 1880.....	40, 000. 00
March 3, 1881.....	6, 000. 00
August 2, 1882.....	10, 000. 00
August 5, 1886.....	5, 000. 00
August 11, 1888.....	5, 000. 00
September 19, 1890.....	5, 000. 00
July 13, 1892.....	7, 000. 00
August 18, 1894.....	5, 000. 00
June 3, 1896.....	5, 000. 00
March 3, 1899.....	5, 000. 00
June 13, 1902 (allotment).....	5, 000. 00
March 3, 1905 (allotment).....	5, 000. 00
March 2, 1907 (allotment).....	13, 178. 63
	116, 178. 63
Total for both projects.....	136, 178. 63

## CONTRACT IN FORCE.

Name of contractor: Hawley Miller.

Date of contract: June 18, 1907.

Date of approval: June 28, 1907.

Date of commencement: Not determined.

Date of completion: Within four months from commencement.

Dredging about 43,750 cubic yards of material, at 32 cents per cubic yard, scow measurement.

## COMMERCIAL STATISTICS.

*Freight received and shipped by water, 1906.*

[Statement by various merchants located on the river.]

Articles.	Tons.	Estimated value.
<b>Received:</b>		
Coal.....	10,787	\$48,892
Manure.....	9,200	9,200
Lime.....	25	800
Brick and stone.....	4,000	7,000
Iron, etc.....	4,000	5,200
Coal dust.....	280	490
Sawdust.....	300	900
Fertilizer.....	5,700	7,126
<b>Shipped:</b>		
Brick.....	130,708	554,018
Conduits.....	15,949	127,592
Flue linings.....	10,293	82,344
Fireproofing.....	7,148	31,852
Wall coping.....	2,277	22,770
Sewer pipe.....	91	728
Sand.....	21,548	21,800
Fire brick.....	2,918	50,724
Clay.....	1,008	1,615
<b>Total.....</b>	<b>226,227</b>	<b>972,650</b>

*Vessels engaged in above commerce.*

Class.	Trips.	Draft when loaded.	Tonnage.
		<i>Feet.</i>	
Steamers.....	126	7 to 8½	100 to 200
Sail vessels.....	490	5 to 8	75 to 350
Barges, etc.....	665	5 to 10	75 to 500
<b>Total.....</b>	<b>1,221</b>		

## EXTRACT FROM A LETTER OF MR. GEORGE SMITH, OF SOUTH RIVER, N. J.

The river needs dredging, as we can not get up it with scows drawing more than 6 feet at high water. It would mean 15 cents per ton to the farmer if we could get up with larger boats, as the towing is now very high. There are also six manufacturing plants along the river that ship mostly by rail for want of more water in the river. The farmers also want a freight boat to carry the products of the farm to the New York market.

EXTRACT FROM A LETTER OF THE AMERICAN ENAMELED BRICK AND TILE COMPANY,  
1 MADISON AVENUE, NEW YORK CITY.

We are getting out considerable business elsewhere, but there is no reason why we should not get out a great deal more if we had deeper water, not only in front of our bulkhead where we propose to make it deep, but also between that point and the Raritan River.

If this were the case, we could ship in deep-water vessels and ship a great many tons of our product to points along the Atlantic coast, such as Portland, Boston, and other coast cities where the vessels must go out into the open sea to effect delivery.

Our company is going to considerable expense for local dredging of the South River channel in front of our own bulkhead, by authority of the proper department of the United States Government.

EXTRACT FROM A LETTER OF THE NEW YORK GRANITE BRICK COMPANY, 39 CORTLANDT STREET, NEW YORK CITY.

The plant of the New York Granite Brick Company has just started and we expect to make some large shipments from this time on. The capacity of our plant is over 200 tons a day, the greater portion of which will be shipped to the New York market by water. Any improvement that can be made to South River in the neighborhood of our factory would be of considerable benefit in the matter of making shipments, as at the present time we are compelled to delay our shipments waiting the tides, which would not be necessary if the channel were dredged. If, however, the river was dredged so that we might tow out at more convenient times, the cost would be reduced sufficiently to permit us to make practically all of our deliveries to the New York market by water. There are several manufacturing plants above ours on the river which also need the improvements as much or more than we do.

EXTRACT FROM A LETTER FROM THE BROOKFIELD GLASS COMPANY, 220 BROADWAY, NEW YORK CITY.

At present the principal industries located above that point are the J. C. Appleby Sand and Clay Company, the New York Granite Brick Company, Old Bridge Enameled Brick and Tile Company, the Brookfield Glass Company, and the Smith Manure Yard and Dock.

In addition to these, all of whom are going concerns of considerable size, there is a large amount of property on both sides of the river having railroad facilities as well as the river, which are only waiting for the river to be opened to navigation up to Old Bridge. The present channel is only 10 feet wide, and navigation is also hampered by several sand bars at various points in the river. In a channel with a new width of 22 feet and 4 or 5 feet deep at low water, except at the few sand bars, which would be a simple matter to dredge out, the river would be open to navigation all the way up to Old Bridge. At high water now tugs draw barges up to within a few hundred feet of Old Bridge. The character of the industries established at present on the river would make it possible for them to do most of their business by water, whereas now only a very small percentage is possible. The river being so difficult to navigate, the towing charges are high, and the tug men, with the exception of a few, are reluctant to tow at any figure. The river at a point below Bizet's brickyard is at present, as I understand it, in the condition that we ask you to make the river all the way up. If the river is dredged out at the lower end only a few will have the benefit of the money spent, whereas if the work is spread out every property owner and the town of Old Bridge will have whatever benefits there are.

My company, the Brookfield Glass Company, has built a plant which has been in operation only a short time, ten months. During that time we have only been able to receive by water about \$13,000 worth of raw materials and to ship nothing. We are going to enlarge our plant this summer and move the rest of our business to Old Bridge. Based on an average of two years—not the largest years—I submit below a statement of what our business has been, which will show you the possibilities of navigation on the river by opening it up to us, or our plant. In this statement I only give you the raw materials, which could come up the river instead of on the railroads, at a reduction to us in the cost of the manufacturing of the products.

*Yearly average raw materials based on two years.*

Lime and marble dust-----	\$6, 369	Iron, castings, etc -----	\$7, 971
Coal -----	57, 000	Glass cullet-----	14, 073
Oils -----	6, 900	Hay -----	3, 250
Lumber and boxes-----	15, 794	Soda ash-----	52, 300
Barrels -----	16, 386		
Brick, clay, and sand-----	21, 522	Total -----	201, 565

In addition to this our finished product, amounting to over \$500,000, average of five years, three-quarters of which we ship to the New York market, could go by water.

Smith's business is conducted entirely by water now.

The Old Bridge Tile Works, I believe, does no business at all on the river, the J. C. Appleby sand business very little, and the New York Granite Brick Company a limited amount; also the town of Old Bridge nothing at all. Practically all the business that is done on the river now is done below Bizet's brickyard.

If the appropriation is spent on the lower part of the river entirely the navigation would not increase nearly to any such great amount as it would if the river was dredged out all the way up, as the business industries at the lower end are able to use the river now, whereas up the river, above Bizet's, it is practically of very little use to the industries located there.

EXTRACT FROM A LETTER OF MR. ISAAC V. PEARSON, TREASURER OF THE J. C. APPLEBY SAND AND CLAY COMPANY, JERSEY CITY, N. J.

As per the inclosed statement, our shipments for 1906 were approximately 1,500 tons, which were shipped not by a steamer or a sail vessel or a barge, but by canal boats, we never having had the benefit of water delivery on account of the small channel and the sand bars from South River to our point, which is directly opposite the Brookfield Glass Works.

While our grades of sands have been acceptable to the various users of Albany and other competitive grades, yet our prices have of necessity been prohibitive in obtaining orders via boat delivery to such points as Troy, Connecticut, Massachusetts, etc., unless we first rail the sand to South Amboy and then load it on boat.

It is necessary for us at present to ship about 200 tons to a cargo in canal boats with rudders, and the cost for towing these small boats is as much as it would be for 400 tons. Various industries have applied to our vicinity for sites, but the river privileges did not appeal to them.

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#### (E) ELIZABETH RIVER.

Detailed description of this river and of the project for its improvement are printed in the Annual Report of the Chief of Engineers for 1897, pages 1134 and 1185, and a condensed history is contained in the current summary.

#### OPERATIONS DURING THE PAST FISCAL YEAR.

Project for expenditure of unexpended balance of \$215.55 and allotment of \$9,784.45 from the consolidated appropriation, act of March 2, 1907, was approved on March 22. It provides for dredging, for maintenance of channel. Under advertisement of April 26 proposals for dredging were opened on May 27, 1907, and the bid of Morrison Dredging Company of New Jersey, Newark, N. J., at 39 cents per cubic yard, prism measurement, the only one received, was accepted, and a contract dated June 18, approved June 27, 1907, was entered into for the removal of about 20,512 cubic yards of material at the price named. At the close of the fiscal year work had not been begun under this contract.

*Money statement.*

July 1, 1906, balance unexpended.....	\$221. 87
Amount appropriated by river and harbor act approved March 2, 1907.....	9, 784. 45
	10, 006. 32
June 30, 1907, amount expended during fiscal year, for maintenance of improvement.....	13. 12
July 1, 1907, balance unexpended.....	9, 993. 20
July 1, 1907, amount covered by uncompleted contracts.....	8, 000. 00
Amount (estimated) required for completion of existing project.....	16, 160. 00
Amount that can be profitably expended in fiscal year ending June 30, 1909, in addition to the balance unexpended July 1, 1907:	
For works of improvement.....	\$16, 160. 00
For maintenance of improvement.....	10, 000. 00
	26, 160. 00
Submitted in compliance with requirements of sundry civil act of June 4, 1897, and of section 7 of the river and harbor act of 1899.	

## APPROPRIATIONS.

March 3, 1879.....	\$7, 500. 00	June 3, 1896.....	\$3, 160. 00
June 14, 1880.....	7, 500. 00	June 13, 1902 (allotment) ..	2, 000. 00
March 3, 1881.....	4, 000. 00	March 3, 1905 (allotment) ..	5, 000. 00
August 2, 1882.....	8, 000. 00	March 2, 1907 (allotment) ..	9, 784. 45
September 19, 1890.....	5, 000. 00		
July 13, 1892.....	5, 000. 00	Total.....	59, 944. 45
August 18, 1894.....	3, 000. 00		

## CONTRACT IN FORCE.

Name of contractor: Morrison Dredging Company, of New Jersey.  
Date of contract: June 18, 1907.  
Date of approval: June 27, 1907.  
Date of commencement: Not determined.  
Date of completion: Within three months from commencement.  
Dredging about 20,512 cubic yards of material at 39 cents per cubic yard, prism measurement.

## COMMERCIAL STATISTICS.

*Freight received and shipped by water, 1906.*

[Statement by various merchants located on the river.]

Articles.	Tons.	Estimated values.
<b>Received:</b>		
Paper and paper stock.....	21	\$400
Coal tar.....	750	5, 700
Pitch.....	301	4, 515
Brick.....	15, 000	106, 142
Coal and gas coal.....	11, 527	87, 329
Machinery.....	4	2, 000
Sand.....	8, 952	2, 790
Lumber.....	3, 000	65, 000
Gravel.....	2, 838	2, 794
Chemicals.....	1, 001	8, 924
Clams and oysters.....	500	1, 000
<b>Shipped:</b>		
Coal tar.....	375	3, 000
Paper and felt.....	2, 073	95, 285
Oil.....	452	2, 800
Pitch.....	19	285
Machinery.....	2	1, 000
Oil tar.....	438	970
Brick.....	1, 000	12, 000
Chemicals.....	7	850
Total.....	43, 255	352, 784

*Vessels engaged in above commerce.*

Class.	Trips.	Draft when loaded.	Tonnage.
		<i>Feet.</i>	
Steamers .....	9	4 to 10	40 to 200
Sail vessels .....	297	4 to 9	100 to 250
Barges, etc .....	145		
Total .....	451		

## (F) SHOAL HARBOR AND COMPTON CREEK.

Detailed description of this locality and of the project for its improvement are printed in the Annual Report of the Chief of Engineers for 1897, page 1150, and a condensed history is contained in the current summary.

## OPERATIONS DURING THE PAST FISCAL YEAR.

Project for expenditure of unexpended balance of \$249.43 and allotment of \$9,750.57 from the consolidated appropriation, act of March 2, 1907, was approved on March 22. It provided for dredging for maintenance of channel. Under advertisement of April 26 proposals for dredging were opened on May 27, 1907, and the bid of J. M. Briggs, New York City, at 60 cents per cubic yard, scow measurement, the only one received, was accepted, and a contract dated June 20, approved on June 29, 1907, was entered into for the removal of about 13,333 cubic yards of material at the price named. At the close of the fiscal year work had not been begun under this contract.

*Money statement.*

July 1, 1906, balance unexpended .....	\$657.02
Amount appropriated by river and harbor act approved March 2, 1907 .....	9,750.57
	10,407.59
June 30, 1907, amount expended during fiscal year, for maintenance of improvement .....	414.39
July 1, 1907, balance unexpended .....	9,993.20
July 1, 1907, amount covered by uncompleted contracts .....	8,000.00
Amount (estimated) required for completion of existing project .....	47,130.00
Amount that can be profitably expended in fiscal year ending June 30, 1909, in addition to the balance unexpended July 1, 1907:	
For works of improvement .....	\$47,130.00
For maintenance of improvement .....	10,000.00
	57,130.00
Submitted in compliance with requirements of sundry civil act of June 4, 1897, and of section 7 of the river and harbor act of 1899.	

## APPROPRIATIONS.

September 19, 1890 .....	\$5,000.00	June 13, 1902 (allotment) ..	\$8,000.00
July 13, 1892 .....	3,000.00	March 3, 1905 (allotment) ..	5,000.00
August 18, 1894 .....	3,000.00	March 2, 1907 .....	9,750.57
June 3, 1896 .....	5,000.00		
March 3, 1899 .....	8,000.00	Total .....	48,750.57

## CONTRACT IN FORCE.

Name of contractor: J. M. Briggs.  
 Date of contract: June 20, 1907.  
 Date of approval: June 29, 1907.  
 Date of commencement: Not determined.  
 Date of completion: Within three months from commencement.  
 Dredging about 13,333 cubic yards of material, at 60 cents per cubic yard scow measurement.

## COMMERCIAL STATISTICS.

*Freight received and shipped by water, 1906.*

[Statements furnished by Mr. Vernon S. Vail and Mr. Antonius Gibson, of Port Monmouth, N. J.]

Articles.	Tons.	Estimated value.
<b>Received:</b>		
Coal.....	8,120	\$15,420
Fertilizer.....	2,500	7,500
Fish and clams.....	5,000	90,000
Barrels.....	8	300
<b>Shipped:</b>		
Fish scrap.....	1,240	38,000
Farm produce.....	18,000	600,000
Fish oil.....	150	6,500
Fish and clams.....	4,500	410,000
Fish grease.....	20	200
<b>Total.....</b>	<b>34,538</b>	<b>1,167,920</b>

*Vessels engaged in above commerce.*

Class.	Number.	Number of trips.	Draft when loaded.	Tonnage.
			<i>Feet.</i>	
Steamers.....	8	380	4 to 8	20 to 600
Sail vessels.....	84	3,900	2 to 7	7 to 120
Barges.....	17	180	5 to 8	2 to 600
Power boats.....	140	50,900	1 to 6	1 to 30
<b>Total.....</b>	<b>249</b>	<b>54,760</b>		

## (G) CHEESEQUAKE CREEK.

Detailed description of this waterway and of the projects for its improvement are printed in the Annual Report of the Chief of Engineers for 1886, pages 763 to 765, and a condensed history is contained in current summary.

## OPERATIONS DURING THE PAST FISCAL YEAR.

At the close of the last fiscal year dredging had been in progress under contract with A. C. Driscoll for restoration of channel between the jetties, in accordance with project approved August 17, and modified September 18, 1905. This project was extended July 6, 1906, to provide for continuing dredging under allotment of \$1,000, on June 22, 1906, from the emergency appropriation of March 3, 1905, and a supplementary contract with A. C. Driscoll was entered into July 20, 1906, and approved July 28 and 30, 1906, for dredging about 2,500 cubic yards of material, in addition to the amount pro-



vided in the original contract, at 40 cents per cubic yard, scow measurement.

Work under the supplementary contract was commenced on August 3 and completed on August 31. The work accomplished consisted in extending the channel 600 feet with width of 50 feet to the 5-foot curve in Raritan Bay, and in widening the channel 40 feet, a length of 550 feet, extending from the outer end of the west jetty to the 5-foot curve in the bay. The amount dredged under the supplementary contract was 2,601 cubic yards, from which 733 cubic yards were deducted for dredging overdepth, leaving the amount of the estimate for which payment was made 1,868 cubic yards.

The total amount dredged under the contract, dated March 14, 1906, and supplementary contract, dated July 20, 1906, was 9,074 cubic yards, and the total work accomplished consisted in restoring the channel of the creek to depth of from 5 to 6 feet from the Highway bridge to the 5-foot curve in Raritan Bay, a distance of 1,800 feet, with depth of from 50 to 90 feet.

The dredged material was disposed of by depositing it in the old bed of the creek west of the west jetty and on the flats owned by private parties west of the jetty.

Project for expenditure of unexpended balance of \$315.04, and allotment of \$3,604.96 from the consolidated appropriation, act of March 2, 1907, was approved on March 22. It provides for dredging for restoration of the channel to its projected width of 100 feet from the bay to the Highway bridge, or to as great a width as the available funds will admit. Under advertisement of April 26 proposals for dredging were opened on May 27, 1907, and the bid of Hawley Miller, Albany, N. Y., at 42½ cents per cubic yard, scow measurement, the lower of two received, was accepted, and a contract dated June 18, 1907, approved on June 26, 1907, was entered into for the removal of about 8,000 cubic yards of material at the price named. At the close of the fiscal year work had not been begun under this contract.

#### *Money statement.*

July 1, 1906, balance unexpended.....	\$3,569.03
Amount appropriated by river and harbor act approved March 2, 1907.....	3,604.96
	<hr/>
	7,173.99
December 27, 1906, returned to Treasury.....	252.68
	<hr/>
	6,921.31
June 30, 1907, amount expended during fiscal year, for maintenance of improvement.....	2,925.21
	<hr/>
July 1, 1907, balance unexpended.....	3,996.10
July 1, 1907, outstanding liabilities.....	2.00
	<hr/>
July 1, 1907, balance available.....	3,994.10
	<hr/>
July 1, 1907, amount covered by uncompleted contracts.....	3,400.00
Amount (estimated) required for completion of existing project.....	50,000.00
	<hr/>
Amount that can be profitably expended in fiscal year ending June 30, 1909, in addition to the balance unexpended July 1, 1907:	
For works of improvement.....	\$25,000.00
For maintenance of improvement.....	4,000.00
	<hr/>
	29,000.00
Submitted in compliance with requirements of sundry civil act of June 4, 1897, and of section 7 of the river and harbor act of 1899.	

## APPROPRIATIONS.

June 14, 1880.....	\$20,000.00
March 3, 1881.....	5,000.00
August 2, 1882.....	15,000.00
March 3, 1905 (allotment).....	5,000.00
March 3, 1905 (allotment).....	1,000.00
March 2, 1907 (allotment).....	3,604.96
<b>Total</b> .....	<b>49,604.96</b>
December 27, 1906, returned to Treasury.....	252.68
<b>Balance</b> .....	<b>49,352.28</b>

## CONTRACT IN FORCE.

Name of contractor: Hawley Miller.  
 Date of contract: June 18, 1907.  
 Date of approval: June 26, 1907.  
 Date of commencement: Not determined.  
 Date of completion: Within two months from commencement.  
 Dredging about 8,000 cubic yards of material, at 42½ cents per cubic yard, scow measurement.

## COMMERCIAL STATISTICS.

*Freight shipped and received by water, 1906.*

[Statements by Capt. John B. Collins, of Keansburg, N. J., and Capt. Thomas W Collins, Port Monmouth, N. J.]

Articles.	Tons.	Estimated value.
<b>Received:</b>		
Manure.....	8,500	\$11,700
Fertilizer.....	300	12,000
Coal.....	2,000	10,000
Fish.....	1,000	4,000
Brick and lumber.....	500	1,500
<b>Shipped:</b>		
Produce.....	11,000	\$30,000
Clay.....	20,000	33,000
Sand.....	15,000	15,000
Fish scrap.....	300	24,000
Brick.....	21,068	110,000
Fish.....	780	46,808
Clams.....	2,700	27,000
<b>Total</b> .....	<b>83,648</b>	<b>625,000</b>

*Vessels engaged in above commerce.*

Class.	Number of trips.	Draft when loaded.	Tonnage.
		<i>Fect.</i>	
Steamers.....	375	6 to 8	25 to 650
Sail vessels.....	200	5 to 6	40 to 60
Barges, etc.....	15	6 to 7	150 to 300
<b>Total</b> .....	<b>590</b>		

One new transportation line has been established during the year.

EXTRACT FROM A LETTER RECEIVED FROM CAPT. J. B. COLLINS, KEANSBURG, N. J.

I am of the opinion that all money used by the Government so far has been well spent. I think that the principal benefit last year was enjoyed by the farmers, who were enabled to ship their produce at more convenient times and in better season for the markets.

In addition, however, there has been shipped about 20,000 tons of brick from brickyards in the vicinity of Morgan and Cliffwood. Most of the brick was brought to the creek on trolley cars and loaded there on vessels sailing to New York and other ports. These shipments can be traced directly to the improvements in the creek. There has also recently been started another brickyard, on which there has already been spent about \$100,000, which yard, when completed, will no doubt be heavy shippers out of the creek, as they are not located on the railroad.

EXTRACT FROM A LETTER RECEIVED FROM MR. GEORGE BROWN, VICE-PRESIDENT OF THE JERSEY CENTRAL TRACTION COMPANY, KEYPORT, N. J.

Cheesequake Creek is about the only waterway on Raritan Bay that is open all the year round. It would be a great convenience to transportation if this channel could be deepened to 12 or 15 feet; more especially if Stump Creek, which enters Cheesequake Creek close to the bay, can also be deepened to enable barges and vessels of 10 and 12 feet draft to enter. If this could be done, all brick for New York market in this vicinity would be shipped from this point.

## G 6.

### IMPROVEMENT OF SHREWSBURY RIVER, NEW JERSEY.

Detailed descriptions of this river and of the projects for its improvement are printed in the Annual Reports of the Chief of Engineers for 1897, pages 1152 and 1155; for 1900, page 185, and a condensed history is contained in current summary.

#### OPERATIONS DURING THE PAST FISCAL YEAR.

At the close of the last fiscal year dredging under contract with Michael H. Flannery had been suspended owing to the death of the contractor. Work was resumed under the direction of the administratrix of the estate of the contractor on August 8 and continued to October 6, when it was suspended on account of the inability of the administratrix to carry it on. The work accomplished during the fiscal year under this contract consisted in dredging 17,112 cubic yards of material at Island Beach bar in making seven cuts each 25 feet wide and from 250 to 1,300 feet long and 7 to 8 feet deep at mean low water.

The total amount of material removed under the contract was 24,165 cubic yards. The material was disposed of by depositing it on shore behind bulkheads at Seabright and Waterwitch.

The matter of the contract was reported to the Chief of Engineers on October 19, recommending its annulment, and that the offer of The John L. Mills Company to complete the work at the former contract price be accepted. This recommendation was approved by the Department on October 22 under conditions set forth, and a contract, dated October 31, 1906, was entered into with The John L. Mills Company for dredging about 33,000 cubic yards of material at 28 cents per cubic yard. Dredging under this contract was commenced on November 10 and continued to November 30, when it was suspended for the winter. Work was resumed on May 1, 1907, and was in progress at the close of the fiscal year.

The work accomplished under this contract during the year consisted in the removal of 8,511 cubic yards of material, of which 1,840 yards were removed from Island Beach bar, making one cut 25 feet wide and 550 feet long, in restoring the channel at Upper Crossover,

North Branch, from which locality 3,455 cubic yards were removed, making five cuts from 110 to 345 feet in length and 25 feet in width, and in dredging three cuts, each 25 feet wide and 250, 460, and 140 feet long, respectively, through the bar at Reeves channel, from which locality 3,216 yards were removed. The depths made were 7 to 8 feet at mean low water. The material was disposed of by dumping it in a basin at Waterwitch, whence it was pumped ashore behind a bulkhead for the purpose of making land.

A project for the expenditure of \$10,000, appropriated by act of March 2, 1907, was approved on March 22. It provides for dredging, for maintenance, and possibly some dike repairs.

Specifications were prepared and approved June 10, 1907, but pending the results of the work now in progress under contract further work will not be advertised.

#### *Money statement.*

July 1, 1906, balance unexpended.....	\$20,430.42
Amount appropriated by river and harbor act approved March 2, 1907.....	10,000.00
	<hr/> 30,430.42
June 30, 1907, amount expended during fiscal year, for maintenance of improvement.....	7,448.97
	<hr/> 22,981.45
July 1, 1907, balance unexpended.....	22,981.45
July 1, 1907, outstanding liabilities.....	2,249.56
	<hr/> 20,731.89
July 1, 1907, balance available.....	20,731.89
July 1, 1907, amount covered by uncompleted contracts.....	6,816.92
	<hr/> <hr/> 13,914.97
Amount that can be profitably expended in fiscal year ending June 30, 1909, for maintenance of improvement, in addition to the balance unexpended July 1, 1907.....	
Submitted in compliance with requirements of sundry civil act of June 4, 1897, and of section 7 of the river and harbor act of 1899.	
	20,000.00

#### APPROPRIATIONS.

##### For previous project:

August 30, 1852.....	\$1,500
March 3, 1871.....	14,000
March 3, 1873.....	5,000
	<hr/> \$20,500

##### For present project:

June 18, 1878.....	18,000
March 3, 1879.....	10,000
June 14, 1880.....	30,000
March 3, 1881.....	86,000
August 2, 1882.....	30,000
August 5, 1886.....	10,000
August 11, 1888.....	10,000
September 19, 1890.....	10,000
July 13, 1892.....	10,000
August 18, 1894.....	5,000
June 3, 1896.....	15,000
March 3, 1899.....	10,000
June 6, 1900 (allotment—maintenance).....	10,000
June 13, 1902.....	75,000
March 3, 1905.....	20,000
March 2, 1907.....	10,000
	<hr/> 359,000

Total for both projects..... 379,500

## CONTRACTS IN FORCE.

Name of contractor: Michael H. Flannery.

Date of contract: December 16, 1905.

Date of approval: December 26, 1905.

Date of commencement: March 1, 1906.

Date of completion: July 31, 1906. (Time of completion waived.)

Dredging about 57,142 cubic yards of material, at 28 cents per cubic yard, scow measurement. Contract annulled October 22, 1906.

Name of contractor: The John L. Mills Company.

Date of contract: October 31, 1906.

Date of approval: November 7, 1906.

Date of commencement: November 10, 1906.

Date of completion: June 9, 1907. (Time of completion waived.)

Dredging about 33,000 cubic yards of material, at 28 cents per cubic yard, scow measurement.

## COMMERCIAL STATISTICS.

*Freight received and shipped by water, 1906.*

[Statement by Capt. C. E. Throckmorton, Red Bank, N. J., for north branch of the river, and F. G. and W. R. Patten, Long Branch, N. J., for south branch of the river.]

Articles.	Tons.	Estimated value.
<b>Received:</b>		
Coal.....	30,000	\$150,000
Lumber.....	1,000	30,000
Building material.....	15,000	750,000
Miscellaneous.....	902,500	1,005,000
<b>Shipped:</b>		
Farm produce.....	200,000	4,000,000
Fish and shell fish.....	10,000	400,000
Miscellaneous.....	510,000	900,000
<b>Total.....</b>	<b>1,668,500</b>	<b>7,235,000</b>

*Vessels engaged in above commerce.*

Class.	Trips.	Draft when loaded.	Tonnage.
Steamers.....	2,050	<i>Feet.</i> 4½ to 5½	300 to 875
Sail vessels.....	100	3½ to 5	25 to 40
<b>Total.....</b>	<b>2,150</b>		

The following information was given by Messrs. T. G. & W. R. Patten, Long Branch, N. J., for the year 1905:

"The number of passengers carried by the Patten Line during the year 1905 was 310,367. The most noticeable effect, outside of the large increase of passengers, of the river improvement was the immediate increase of through freight to Asbury Park and intermediate points. The large department stores in New York are at present making their out-of-town deliveries through us, and the perishable freight showed a constant and marked development.

"The increase has been so marked that this company is planning the erection of new and larger docks, with new terminal facilities for rapid handling of freight, and expect that the demand for this method of express-freight delivery will necessitate the construction of a new boat this fall."

## G 7.

## IMPROVEMENT OF MANASQUAN RIVER, NEW JERSEY.

Detailed description of this river and the project for its improvement are printed in the Annual Report of the Chief of Engineers for 1898, page 1070, and a condensed history is contained in current summary.

## OPERATIONS DURING THE PAST FISCAL YEAR.

Nothing in furtherance of the project has been done during the year, pending decision as to the practicability of further work upon this improvement with the funds available. It is now thought that the funds are insufficient to begin the work provided for under the approved project.

*Money statement.*

July 1, 1906, balance unexpended.....	\$4,995. 29
June 30, 1907, amount expended during fiscal year, for maintenance of improvement .....	18. 65
July 1, 1907, balance unexpended.....	4,976. 64
Amount (estimated) required for completion of existing project.....	14,375. 00

## APPROPRIATIONS.

March 3, 1879.....	\$12,000	March 3, 1899.....	\$5,000
June 14, 1880.....	20,000		
August 2, 1882.....	7,000	Total .....	46,000
September 19, 1890.....	2,000		

## COMMERCIAL STATISTICS.

[Statistics for 1906 have not been received. The following statement, furnished by W. K. Blodgett, Point Pleasant, N. J., is for 1905.]

Articles.	Tons.	Estimated value.
Received, fish.....	50	\$2,000

*Vessels engaged in above commerce.*

Class.	Trips.	Draft when loaded.
Naphtha .....	10	Feet. 3

The commerce of this river is small owing to obstructions at the inlet. The river is largely used by pleasure craft during the summer season, and the inlet is used to some extent by small fishing boats.

## G 8.

## REMOVING SUNKEN VESSELS OR CRAFT OBSTRUCTING OR ENDANGERING NAVIGATION.

1. *Wreck of unknown hulk in Raritan Bay, off Lorillard, New Jersey.*—This wreck was reported on July 12 and again on July 27,

1906, as a dangerous obstruction to navigation, having caused injury by collisions. The wreck was examined and found to be an old hulk, just awash at low tide, about 100 feet long and lying on its side in 11 feet of water at low water. No particulars could be learned in regard to where the derelict came from, owners, etc. The matter was reported to the Chief of Engineers, and on August 10, 1906, the sum of \$750 was allotted by the Department for its removal. An additional allotment of \$100 was made on October 2.

Sealed proposals for the removal of this wreck were requested, and the bid of Jesse A. Gray, the lowest of three received, who proposed to remove the wreck for the sum of \$640, was accepted. The method used by the contractor was to shatter the wreck by means of explosives, but subsequent examinations showed that several pieces were left on the bottom which the contractor failed to remove.

The matter was referred to the Chief of Engineers on October 8, and under date of October 19, 1906, a settlement for work done was authorized. It is not now proposed to complete the total removal of this wreck.

At the close of the fiscal year the matter of settlement was pending. In a letter dated June 26, 1907, to the Chief of Engineers it was proposed to pay the contractor \$415 for work done, that amount being accepted by him.

2. *Wreck of the canal boat Geo. H. Notter in Kill van Kull, New York and New Jersey.*—This wreck was reported on January 12 and 14, 1907. An examination was made, from which it appears the wreck which had been abandoned was that of the canal boat *Geo. H. Notter*, owned by J. J. Herbert, 1 Broadway, New York City, loaded with soft coal, and consigned to the Curtis-Blaisdell Company, New York City, and that it was located about 200 feet off pier No. 4 of the Standard Oil Company in water 30 feet deep.

The matter was reported to the Chief of Engineers and an allotment of \$900, dated January 22, was made for its removal. The removal of this wreck was advertised by public notice, and the bid of John F. Baxter, the lower of two received, to do the work for the sum of \$544 was accepted.

The work of removal was accomplished on February 16, 1907, and the wreck was deposited in the contractor's yard at Weehawken, N. J., the cargo of about 200 tons of soft coal becoming the property of the contractor under the terms of the contract. After the wreck had been taken up it appeared that pieces of the stem, which had been broken off by collision, still remained on the bottom. A thorough sweeping was made and these pieces removed on February 21, completing the contract.

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#### EMERGENCY CONTRACT IN FORCE.

Name of contractor: John F. Baxter.

Date of contract: February 6, 1907.

Date of commencement: February 11, 1907.

Date of completion: February 23, 1907.

Removal of canal boat *Geo. H. Notter*, lying in Kill van Kull, off Constable Hook, N. J., for the sum of \$544.





## APPENDIX H.

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### IMPROVEMENT OF DELAWARE RIVER, NEW JERSEY AND PENNSYLVANIA, AND OF CERTAIN WORKS IN DELAWARE BAY, DELAWARE.

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REPORT OF MAJ. J. C. SANFORD, CORPS OF ENGINEERS, OFFICER IN CHARGE, FOR THE FISCAL YEAR ENDING JUNE 30, 1907.

#### IMPROVEMENTS.

- |   |  |
|---|--|
| 1. Delaware River, New Jersey and Pennsylvania.                       | 6. Delaware Breakwater, Delaware.  |
| 2. Perriwig bar, Delaware River.                                      | 7. Construction of harbor of refuge, Delaware Bay, Delaware.               |
| 3. Harbor between Philadelphia, Pennsylvania, and Camden, New Jersey. | 8. Removing sunken vessels or craft obstructing or endangering navigation. |
| 4. Ice harbor at Marcushook, Pennsylvania.                            | 9. Construction of hydraulic dredges.                                      |
| 5. Construction of iron pier in Delaware Bay, near Lewes, Delaware.   |  |
- 

ENGINEER OFFICE, UNITED STATES ARMY,  
*Philadelphia, Pa., July 9, 1907.*

GENERAL: I have the honor to transmit herewith the annual reports for the works of river and harbor improvement of the Philadelphia district, also of dredge construction in my charge, for the fiscal year ending June 30, 1907.

Very respectfully, your obedient servant,

J. C. SANFORD,  
*Major, Corps of Engineers.*

Brig. Gen. A. MACKENZIE,  
*Chief of Engineers, U. S. A.*

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#### H 1.

### IMPROVEMENT OF DELAWARE RIVER, NEW JERSEY, PENNSYLVANIA, AND DELAWARE.

An account of this improvement is contained in the Annual Reports of the Chief of Engineers for 1896, page 877; 1897, page 1192; 1898, page 1075; 1899, page 1317; 1900, page 1557; 1901, page 1310; 1902, page 1025; 1903, page 957; 1904, page 1181; 1905, page 1065, and 1906, page 1021.

Expenditures during the past fiscal year have been applied to the following operations:

1. Surveys.
2. Excavation under contract of the 30-foot channel between Finns Point and the south line of Pennsylvania.
3. Improvement of Schooner ledge.
4. Work of the United States dredging plant in excavation of the 30-foot channel and in maintenance.

These operations will be described in the above order. The localities referred to and previous operations thereat are described in the Annual Reports of the Chief of Engineers for 1896, pages 1075-1079; 1899, pages 1317-1322.

#### 1. SURVEYS.

In November, 1906, a survey was made at Duck Creek flats to determine the condition of the channel with a view to future maintenance work. A center line survey covering the river from Fort Delaware to deep water in Delaware Bay had also been made in the previous month. The cost of this survey and examination, properly chargeable to maintenance, was \$5,545.43. Numerous surveys in connection with contract work in progress between Finns Point and the south line of Pennsylvania and in connection with hired labor work at Schooner ledge, Tinicum Island flats, Mifflin bar, and Blakes channel have also been made. The expenses of these are charged to the work to which each belongs.

#### 2. EXCAVATION UNDER CONTRACT OF THE 30-FOOT CHANNEL BETWEEN FINNS POINT AND THE SOUTH LINE OF PENNSYLVANIA.

This part of the river is divided into section 3, subsections A and B; section 4, subsections A and B, and section 5, subsection A, and has within its limits Deep Water Point shoal and Cherry Island Flats shoal.

During the past fiscal year operations under the general project have been in progress as follows:

Under a project submitted March 23 and approved April 1, 1905, for the expenditure of \$1,500,000, of which \$500,000 was appropriated and contracts to the extent of \$1,000,000 additional were authorized by the river and harbor act approved March 3, 1905, contracts for work have been entered into as follows, the approximate quantities as stated to be removed under each contract being subject to variation of 10 per cent.

Under date of August 9, 1905, with the Sanford & Brooks Company, of Baltimore, Md., for the excavation and removal by dredging of about 1,467,750 cubic yards, scow measurement, from the channel of the Delaware River between Finns Point and the south line of Pennsylvania, in section 3, subsection A, at 15.45 cents per cubic yard, scow measurement, the work to be commenced within thirty days after August 22, 1905, and completed by December 31, 1906. Work under this contract was commenced on October 2, 1905, and is still in progress, the time for completion of the contract having been waived for a reasonable period under supplemental articles of agreement, dated December 29, 1906.

Up to June 30, 1907, about 690,000 net cubic yards of material, scow measurement, had been removed from the channel and pumped

ashore at Fort Du Pont, Fort Delaware, and the Scott property, above Delaware City, Del. This amount includes 60,852 cubic yards of material which were removed by the U. S. dredge *Delaware*, and credited to the amount removed under this contract, in accordance with a provision of the specifications giving the engineer officer the right to place additional plant on the work at any time when the rate of progress was not up to the specification requirements.

Under date of August 3, 1905, with the Maryland Dredging and Contracting Company, of Baltimore, Md., for the excavation and removal by dredging of about 1,467,750 cubic yards, scow measurement, from the channel of the Delaware River between Finns Point and the south line of Pennsylvania, in section 3, subsection B, at 15.4 cents per cubic yard, scow measurement, the work to be commenced within thirty days after August 18, 1905, and completed by December 31, 1906. Work under this contract was commenced September 28, 1905, and is still in progress, the time for completion of the contract having been waived for a reasonable period under supplemental articles of agreement, dated December 22, 1906.

Up to June 30, 1907, about 1,180,000 net cubic yards of material, scow measurement, had been removed from the channel and pumped ashore at Fort Du Pont, Fort Delaware, at the Scott property, above Delaware City, Del., and above the mouth of Christiana River.

Under date of August 3, 1905, with the American Dredging Company, of Philadelphia, Pa., for the excavation and removal by dredging from the channel of the Delaware River between Finns Point and the south line of Pennsylvania of the following quantities of material from the localities stated, the work to be commenced within thirty days after August 15, 1905, and be completed by December 31, 1906.

Section 4, subsection A, about 1,584,750 cubic yards, scow measurement, at 14 cents per cubic yard, scow measurement.

Section 4, subsection B, about 1,585,500 cubic yards, scow measurement, at 14½ cents per cubic yard, scow measurement.

Section 5, subsection A, about 1,620,000 cubic yards, scow measurement, at 15½ cents per cubic yard, scow measurement.

Work under this contract was commenced August 14, 1905, and completed May 7, 1907, the time of completion having been waived for a reasonable period. The total net amount of material removed under the contract was as follows:

	Cubic yards.
From subsection 4 A .....	1,432, 149
From subsection 4 B .....	1,453, 179
From subsection 5 A .....	1,496, 895
Total .....	4,382, 223

The material removed under this contract was pumped ashore at the following places provided by the contractor: Pigeon Point, Delaware, between Edgemoor, Del., and the mouth of Christiana River, and at Repaupo Point, New Jersey.

The work done under these contracts has made a channel 30 feet deep at low water from Finns Point to the Pennsylvania State line at Marcus Hook, varying in width as follows:

Subsection 3 A, 240 to 360 feet.  
 Subsection 3 B, 350 to 430 feet.  
 Subsection 4 A, 487 to 495 feet.

Subsection 4 B, 495 to 550 feet.  
 Subsection 5 A, 350 to 510 feet.

The amounts expended during the year under the foregoing contracts are as follows:

	Payments.	Office expenses, surveys, superintendence, and inspection.
Sanford & Brooks Company .....	\$64,725.97	\$17,191.59
Maryland Dredging and Contracting Company .....	153,361.19	13,725.43
American Dredging Company .....	476,022.45	32,361.80

The proportionately large cost for office expenses, surveys, etc., under the contract with the Sanford & Brooks Company is due partly to the slowness of work under this contract and partly to the fact that considerable material excavated has not yet been paid for, the amount removed monthly not having been sufficient to earn a payment under the specifications.

The total amount of material removed from the channel by the United States under the general project up to June 30, 1907, under contracts and by United States dredges, exclusive of the rock area at Schooner ledge, and dredging paid for by the State of Pennsylvania and city of Philadelphia, was 20,590,000 cubic yards, scow measurement.

### 3. IMPROVEMENT OF SCHOONER LEDGE.

Operations at this locality were continued by the plant belonging to the United States, authorized by the Department July 29, 1903.

The drill scow *Gen. John Newton* was at work continuously during the year, except when laid up during the winter. The dredge *Hell Gate* and tug *Humphreys* were engaged at Tinicum Island shoal, under the agreement with the city of Philadelphia, from August 15, 1906, to the end of the working season, returning to the rock work at the commencement of the present working season and continuing to the close of the year.

From August 3 to 9, 1906, the *Hell Gate* was engaged in the removal of a sunken ponton off Gloucester, N. J.

As the *Hell Gate* removes the rock faster than the *Newton* breaks it up her services could be dispensed with for the periods above stated without detriment to the work of rock removal, and effected a saving in the cost thereof.

The work done at Schooner ledge during the past fiscal year was as follows:

Removal of 12,821 cubic yards of overlying material, including bowlders.  
Removal of 2,784 cubic yards of ledge rock.  
2,016 holes drilled and blasted.  
24,554 pounds of dynamite used.  
15,665 cubic yards (estimated) rock blasted.

Since the commencement of operations at this locality the following work has been accomplished:

Removal of 117,506 cubic yards of overlying material, including bowlders.  
Removal of 11,986 cubic yards of ledge rock.  
5,030 holes drilled and blasted.  
62,695 pounds of dynamite used.  
49,387 cubic yards (estimated) rock blasted.

Part of the material removed by dredging was deposited behind the bulkhead between Edgemoor, Del., and the mouth of Christiana River, part in the dumping basin at Crum Creek, and some was used by the Light-House Department at Salem Creek, and the new Schooner ledge front light.

The amount expended on the field work at Schooner ledge during the year was \$47,101.90; surveys connected with the work, superintendence, office expenses and inspection, \$5,656; on care and repair of plant, \$13,190.44, including \$1,569.98 for additions and betterments.

#### 4. WORK OF THE UNITED STATES DREDGING PLANT IN EXCAVATION OF THE 30-FOOT CHANNEL AND IN MAINTENANCE.

At the beginning of the year the U. S. self-propelling, suction dredge *Delaware* was engaged in the improvement of a shoal in Philadelphia Harbor under an allotment of \$10,000 made from the appropriation for emergencies in river and harbor work. This work had been begun on June 6, 1906, and was continued until July 5, 1906, 10,968 cubic yards being removed in July, making a total of 109,400 cubic yards removed after June 6. The material was deposited at Mifflin bar dike and rehandled by the U. S. rehandling machine *Cataract*. The total amount expended on this work during the year, including payment of liabilities outstanding at the beginning of the year, was \$7,269.97. From July 6 to 10, and from July 23 to 24, 1906, the *Delaware* worked on Deep Water Point range with a view to hastening the work under contract with the Sanford & Brooks Company, as permitted by the specifications. She removed 60,852 cubic yards of material, most of which was rehandled at Fort Delaware by the rehandling machine *Dewey*, owned by the Sanford & Brooks Company, the remainder being deposited at Mifflin bar dike and rehandled by the *Cataract*. From July 11 to 20, she operated at Mifflin bar removing 69,542 cubic yards, and from July 21 to 22, and July 25 to August 1, she operated on Tinicum Island shoal, removing 43,343 cubic yards. All of the material removed from Mifflin bar and Tinicum Island shoal by the above work was rehandled by the *Cataract* at Mifflin bar dike. From August 2 to 21, 1906, and from June 13, 1907, to the end of the year she was in dry dock. From August 22, 1906, to January 15, 1907, and from May 16 to June 12, 1907, she was operated under the direction of this office for the city of Philadelphia, the cost of her work being paid by the city (see below). From January 16 to 26 she was employed in maintenance dredging on Liston range, 8,896 cubic yards being dredged, which was deposited in deep water in Delaware Bay. During this work she was greatly interfered with by ice, and on the 26th the work had to be discontinued. Arrangements were then made for operating her in Ambrose channel, New York Harbor, during the remainder of the winter season, the Delaware River being credited for her work at the rate of 9 cents per cubic yard of material removed. After making the necessary preparations she proceeded to New York February 5, 1907, beginning work in Ambrose channel on February 11, 1907. She continued on this work until March 7, 1907, removing 289,602 cubic yards of material, when she was sent back to Philadelphia arriving here April 4, 1907. From April 6 to May 15, 1907, she operated on Liston range, removing 79,150 cubic

yards of material, which was deposited in deep water in Delaware Bay. The total amount of material dredged by the *Delaware* during the year is as follows:

	Cubic yards.
Delaware River-----	853, 273
Ambrose channel, New York Harbor-----	289, 602
Total -----	1, 142, 875

The expenditures on the dredge *Delaware* from the Delaware River appropriation during the year in connection with her work has been:

For operation-----	\$43, 333. 56
Alterations and additions-----	6, 223. 77
Office expenses, surveys, superintendence, and inspection-----	1, 385. 00
Total -----	50, 942. 33

A statement from Lieut. Col. W. L. Marshall, Corps of Engineers, indicates that about \$9,734 will probably be paid to the Delaware River appropriation for the amount earned by the *Delaware* at New York, \$26,082.18, less the amount paid by the New York office for her operation, current repairs, etc., \$16,348.13.

The new rehandling machine *Cataract*, purchased by the United States in the spring of 1906 as a tender to the U. S. dredge *Delaware*, has been operated in connection with the *Delaware* whenever the latter was engaged in dredging between Deep Water Point range and the city of Philadelphia, including the time when her expenses were paid by the city. At the beginning of the year the construction of quarters for the crew of the *Cataract* was in progress and was not finally completed until several months later. During this time the small U. S. rehandling machine *Uncle Sam* was used simply as a quarter boat for the *Cataract's* crew. In addition to construction of quarters on the *Cataract*, several important improvements to the machinery and appliances have been made. A ponton pipe line was built for use with the *Cataract*. The minimum length of shore pipe at first purchased has been gradually extended with pipe of better quality purchased to replace the original pipe as the latter wore out. In the latter part of 1906 and in May and June, 1907, the *Uncle Sam* has been used as a rehandling machine, supplementing the work of the *Cataract*. The expenditures by the United States on these rehandling machines have been as follows:

<i>Cataract</i> :	
Field cost and operation-----	\$22, 359. 89
Office expenses and superintendence-----	855. 00
Balance of purchase price-----	70, 600. 00
Quarters, pontons, pipe line, additions, and betterments-----	12, 997. 68
<i>Uncle Sam</i> :	
Care and ordinary repairs, additions, and betterments-----	5, 730. 86
Office expenses and superintendence-----	138. 00

#### IMPROVEMENT OF DELAWARE RIVER BY THE STATE OF PENNSYLVANIA AND THE CITY OF PHILADELPHIA.

Under the appropriations aggregating \$750,000, made in 1905 by the State of Pennsylvania and the city of Philadelphia, to be expended under the direction of the city in accordance with the general project of improvement of Delaware River, an agreement was entered into, under date of July 27, 1906, with the city whereby

Government plant should be placed on the work in sections 7 and 8 and operated under the direction of this office; all cost of the work to be paid for by the city. Under this agreement the dredge *Delaware*, rehandling machines *Cataract* and *Uncle Sam*, and the clam-shell dredge *Hell Gate*, with her tugboat and dump scows were placed on the city work at various dates between August 15 and August 21, 1906. The dredge *Key West* was also borrowed from the Jacksonville, Fla., district for this work and operated between September 14 and December 11, 1906. The *Hell Gate* operated between August 15 and December 24 on Tinicum Island shoal. The *Key West* operated partly on Tinicum Island shoal and partly on Mifflin bar. The *Delaware*, between August 22, 1906, and January 15, 1907, and between May 16 and June 12, 1907, operated on Mifflin bar, Tinicum Island shoal, and shoal opposite League Island. The material removed by the Government dredges under agreement with the city is as follows:

	Cubic yards.
Tinicum Island shoal.....	301,927
Mifflin bar.....	407,277
Shoal opposite League Island.....	21,458
Total.....	730,662

The total amount paid by the city through this office during the year for this work, including office expenses, surveys connected with the work, superintendence and inspection, and care and repair of plant has been \$93,021.11.

Under date of October 29, 1906, the city of Philadelphia entered into a contract with the American Dredging Company for dredging to full width and depth of proposed 30-foot channel in sections 6 A, 6 B, and 9 for a lump sum in each case. These sections, with sections 7 and 8 on which the above-mentioned Government plant has been employed, cover the entire length of the channel from the south line of Pennsylvania to Christian street, Philadelphia. Under this contract work was begun in April, 1907, and has since continued. It has thus far resulted in the excavation of a channel having a width of about 600 feet through subsection 6 A, and of about 50 to 250 feet through subsection 6 B. The dredging has been done with a view to securing a depth of 30 feet at mean low water.

#### RETAINING BANKS AND HYDRAULIC FILLS AT FORT DU PONT AND FORT DELAWARE.

For description of work previously done see Annual Reports of Chief of Engineers for 1904, pages 1184–1185; 1905, pages 1068–1069; 1906, pages 1024–1025.

Under date of July 2, 1906, the Acting Secretary of War allotted the sum of \$5,000 from the appropriation for army transportation, 1907, under control of the Quartermaster's Department, to provide against contingencies in the maintenance of these banks during the fiscal year ending June 30, 1907, the work to be done by the Engineer Department and to be paid for by the Quartermaster's Department.

In July and August, 1906, material dredged under the above-mentioned contracts was pumped ashore at Fort Delaware, completing

the fill at that point except for subsequent settlement. Minor repairs were made to the banks at Fort Delaware in August. An examination of the banks at Fort Du Pont, which had been constructed on a very soft marsh, indicated that extensive strengthening of the banks was necessary before resuming pumping; and to economically strengthen them it was decided that the fill must first be allowed to dry thoroughly in order that it might be used for these repairs, this material being much better suited for the purpose than the soft material outside the banks. For this reason no material was pumped ashore at Fort Du Pont in the latter half of 1906. In March, 1907, a survey of the banks at Fort Dupont was made and in the following month the strengthening of these banks by hired labor was begun. In the early part of June the repairs had been completed on the banks of the north basin, though unusually bad weather had delayed the work; and the pumping of dredged material into the north basin was resumed and continued until the end of the year. The repairs to the banks of the south basin had been partially completed at the close of the year. The following shows the amounts, in cubic yards, scow measurement, of material pumped ashore at these localities during the year under the two dredging contracts:

Contractor.	Fort Delaware.	Fort Du Pont.
Sanford & Brooks Co.....	244,110	84,120
Maryland Dredging and Contracting Co .....	194,460	58,506

The total amount of material, scow measurement, pumped ashore to June 30, 1907, including the above and previous work, is:

1,784,056 cubic yards at Fort Delaware.

845,293 cubic yards at Fort Du Pont.

During the year vouchers amounting in the aggregate to \$2,097.08 were certified and forwarded to the Quartermaster's Department for payment. The outstanding liabilities at the close of the year amounted to \$1,789.88, leaving a balance of \$1,113.04 to be returned to the appropriation.

#### IMPROVEMENT OF PHILADELPHIA HARBOR.

The work of the U. S. dredge *Delaware* in the removal of shoal places in the harbor had been in progress at times.

Under date of December 6, 1906, the Board of Engineer Officers appointed by Department orders dated June 30, 1904, to consider the establishment of harbor lines in the Delaware and Schuylkill rivers, at the harbor of Philadelphia, and to recommend locations for such lines, submitted a report, with maps and descriptions of harbor lines recommended. The expenses connected with this work are charged to the Delaware River improvement.

#### APPROPRIATIONS FOR COMPLETION OF EXISTING PROJECT.

The river and harbor act approved March 2, 1907, appropriated \$895,000 for completing the improvement under the general project for a 30-foot channel, and authorized contracts to an additional



amount not exceeding \$500,000 for maintenance of the dredged channel, to be paid for as appropriations may from time to time be made by law. The same act authorized the expenditure of a sum not exceeding \$200,000 of the amounts appropriated and authorized in widening the channel at the bends therein, below the city of Philadelphia, with a view to securing, so far as practicable, a channel of equal safety and efficiency in all its parts.

A project for the expenditure of these funds was submitted and approved. It provides for the completion of the general project and for maintaining completed sections of the channel, by contract or hired labor, using Government plant, as may prove to the best interests of the United States, and also for widening the channel at the bends below Philadelphia to such an extent as the available funds will permit.

It is understood that these funds are also available for maintenance of the dredged channel along the Philadelphia water front above Christian street.

#### MISCELLANEOUS.

Up to June 30, 1905, 39 wharves between Allegheny avenue and Moore street, on the Delaware River water front of the city of Philadelphia, had been extended to the new pierhead line, and between Pearl and Mickle streets, Camden, 5 wharves had been similarly extended to the New Jersey pierhead line.

During the fiscal year ending June 30, 1904, licenses were granted by the board of port wardens of the city of Philadelphia for the extension of two additional piers on the Philadelphia water front, and in the fiscal year ending June 30, 1905, a license was given for the extension of one more pier, and in the fiscal year ending June 30, 1906, a license was given for the extension of another pier, and in the past fiscal year licenses were given for the extension of two additional piers and one wharf on the Delaware water front. Detailed information with reference to these subjects is given in a letter dated June 19, 1907, from Mr. Theodore C. Knauff, secretary of the board of harbor commissioners, which he has kindly prepared. This letter and its accompanying papers are appended hereto.

Detailed information as to work of dredging in the channel of Delaware River, accomplished under appropriations made by the State of Pennsylvania and city of Philadelphia, is given in a letter from Mr. W. R. Benson, assistant director, department of public works, city of Philadelphia, which he has kindly prepared. This letter and its inclosure are appended hereto.

#### LANDS CEDED TO THE UNITED STATES.

During the past fiscal year the States of Delaware and New Jersey conveyed to the United States all right, title, and interests in and to certain submerged lands in the Delaware River between the States of Delaware and New Jersey, required in connection with the bulkhead for dredged material, constructed by the United States at Baker and Stony Point shoals. Jurisdiction over the lands is also conveyed to the United States. The acts of the legislature of the two

States, approved by the respective governors thereof, conveying the lands and jurisdiction, and the deed to the property, signed by the governor of the State of New Jersey, as authorized and directed by the act of the legislature of that State, are appended hereto.

*Money statement.*

July 1, 1906, balance unexpended.....	\$1, 194, 625. 75
June 30, 1907, credited to appropriation during fiscal year: Sales of condemned property, \$660; sales of blueprints, \$11.98; account services of U. S. dredge <i>Delaware</i> in Wilmington, N. C., district, \$1,303.87; total.....	1, 975. 85
Amount appropriated by river and harbor act approved March 2, 1907.....	895, 000. 00
	<hr/> 2, 091, 601. 60
June 30, 1907, amount expended during fiscal year:	
For works of improvement.....	\$1, 040, 633. 28
For maintenance of improvement.....	8, 710. 17
	<hr/> 1, 058, 343. 45
July 1, 1907, balance unexpended.....	1, 033, 258. 15
July 1, 1907, outstanding liabilities.....	90, 613. 26
	<hr/> 942, 644. 80
July 1, 1907, balance available.....	<hr/> 942, 644. 80
July 1, 1907, amount covered by uncompleted contracts.....	200, 774. 80
Amount (estimated) required for completion of existing project..	500, 000. 00
	<hr/> <hr/>
Amount that can be profitably expended in fiscal year ending June 30, 1900, in addition to the balance unexpended July 1, 1907:	
For works of improvement.....	\$500, 000. 00
For maintenance of improvement.....	135, 000. 00
	<hr/> 635, 000. 00
Submitted in compliance with requirements of sundry civil act of June 4, 1897, and of section 7 of the river and harbor act of 1899.	

APPROPRIATIONS.

July 4, 1836.....	\$15, 000. 00	March 3, 1903.....	\$1, 400, 000. 00
June 10, 1872.....	10, 000. 00	April 28, 1904.....	1, 000, 000. 00
March 3, 1873.....	115, 000. 00	March 3, 1905.....	500, 000. 00
June 23, 1874.....	60, 000. 00	June 30, 1906.....	1, 000, 000. 00
March 3, 1875.....	30, 000. 00	March 2, 1907.....	895, 000. 00
August 14, 1876.....	40, 000. 00		
June 18, 1878.....	110, 000. 00	Total.....	8, 999, 000. 00
March 3, 1879.....	201, 000. 00	Amounts received from other sources as follows:	
June 14, 1880.....	235, 000. 00	Sales, condemned property.....	1, 145. 00
March 3, 1881.....	250, 000. 00	Sales, blueprints.....	11. 98
August 2, 1882.....	286, 000. 00	Services U. S. dredge <i>Delaware</i> in other engineer district..	1, 303. 87
July 5, 1884.....	200, 000. 00		
August 5, 1886.....	210, 000. 00	Grand total.....	9, 001, 460. 85
August 11, 1888.....	250, 000. 00		
September 19, 1890.....	240, 000. 00	Total amount appropriated on present project to June 30, 1907.....	5, 950, 536. 74
July 13, 1892.....	50, 000. 00		
August 18, 1894.....	170, 000. 00		
June 3, 1896.....	500, 000. 00		
March 3, 1899.....	300, 000. 00		
June 6, 1900.....	270, 500. 00		
March 3, 1901.....	61, 500. 00		
June 13, 1902.....	600, 000. 00		

## CONTRACTS IN FORCE.

1. With the Maryland Dredging and Contracting Company, of Baltimore, Md., dated August 3 and approved August 15, 1905, for excavating and removing, by dredging, of about 1,467,750 cubic yards of material from the channel of Delaware River between Finns Point and south line of Pennsylvania, from the locality designated and known as section 3, subsection B, at 15.4 cents per cubic yard scow measurement. Work to be commenced on or before September 17, 1905, and be completed by December 31, 1906. The time limit of this contract has been waived for a reasonable period by supplemental articles of agreement entered into December 22, 1906.

2. With the Sanford & Brooks Company, of Baltimore, Md., dated August 9 and approved August 18, 1905, for excavating and removing, by dredging, of about 1,467,750 cubic yards of material from the channel of Delaware River between Finns Point and south line of Pennsylvania, from the locality designated and known as section 3, subsection A, at 15.45 cents per cubic yard scow measurement. Work to be commenced on or before September 21, 1905, and be completed by December 31, 1906. The time limit of this contract has been waived for a reasonable period by supplemental articles of agreement entered into December 29, 1906.

## COMMERCIAL STATISTICS.

The following statement concerning the foreign commerce of the Delaware River for the years ending December 31, 1905 and 1906, is compiled from reports of the Board of Trade of the city of Philadelphia :

## IMPORTS.

Articles.	1905.	1906.	Articles.	1905.	1906.
	Tons.	Tons.		Tons.	Tons.
Asphalt and asphalt blocks..	8,510	8,810	Mineral water .....	448	3,279
Cement.....	2,767	2,847	Molasses .....	42,153	38,266
Chalk .....	88,087	80,805	Oil .....	2,200	15,377
Clay .....	58,719	69,574	Ores, metals, and manufac-		
Coal .....	119		tures of .....	20,879	34,982
Coal tar, and pitch of .....	6,869	7,651	Plants and seeds .....	2,670	9,724
Cork and cork wood .....	8,152	2,187	Plaster of Paris and plaster		
Cotton and cotton fabrics ..	11,247	11,738	(crude) .....	71,000	79,636
Drugs and chemicals .....	118,104	213,206	Rags .....	14,317	11,144
Earthenware, china and			Salt .....	17,076	9,900
stone ware .....		34,722	Silk, and manufactures of ..	407	188
Fertilizers .....	82,045	27,722	Stone, and manufactures of ..	275	1,143
Fruits .....	24,002	17,446	Sugar .....	252,118	255,057
Glass, and manufactures of ..	2,467	1,971	Sulphur:		
Groceries and provisions ..	19,814	34,048	Crude .....	3,063	6,292
Hair, and manufactures of ..	2,014	4,019	Ore .....	76,827	85,442
Hemp, jute, flax, and their			Tin .....	10,791	8,952
fabrics .....	31,000	31,295	Tobacco .....	1,121	1,200
Hides and skins .....	24,598	22,602	Wines and liquors .....	2,862	658
Iron:			Wood pulp, paper, and man-		
Manufactured .....	20,790	68,838	ufactures of .....	2,809	2,793
Ore .....	299,844	377,241	Wood, and manufactures of ..	33,896	56,841
Pig .....	28,958	72,806	Wool and wool fabrics .....	24,440	17,240
Scrap .....	4,961	1,231	Miscellaneous .....	45,064	55,375
Leather, and manufactures			Total. ....	1,865,245	1,732,936
of .....	2,789	1,500			
Live stock and fowls .....	98	713			

## EXPORTS.

Articles .....	1905.	1906.	Articles.	1905.	1906.
	<i>Tons.</i>	<i>Tons.</i>		<i>Tons.</i>	<i>Tons.</i>
Beef, pork, and products.....	85,268	51,768	Molasses.....	3,294	24,718
Bricks.....	10,689	93	Oats and oatmeal.....	96,047	99,446
Cars and locomotives.....	2,470	196	Oil cake.....	73,691	118,039
Coal.....	749,900	642,249	Oil:		
Corn and corn meal.....	222,580	282,025	Lubricating.....	110,038	181,005
Cotton and cotton fabrics.....	19,253	10,402	Other.....	41,382	251,456
Drugs and chemicals.....	7,073	23,358	Paraffin.....	19,684	18,908
Feed.....	40,566	59,480	Petroleum, crude and refined.....	1,242,824	1,209,642
Fertilizers.....	704	777	Residuum.....	167,264	157,590
Flour.....	143,112	343,019	Rosin and turpentine.....	8,374	8,470
Fruit.....	212	276	Seeds.....	2,060	22,572
Glucose.....	21,009	15,068	Soap, tallow, and grease.....	15,880	18,137
Glue and glue stock.....	82	19	Stone, and manufactures of.....	3,780	16,339
Groceries and provisions.....	17,467	10,676	Tobacco.....	3,684	3,808
Gunpowder and explosives.....	163	264	Wines and liquors.....	1,942	2,566
Hides, leather, and manufactures of.....	1,145	3,819	Wood pulp, paper, and manufactures of.....	895	528
Iron:			Wood, and manufactures of.....	69,811	73,111
Manufactured.....	43,305	51,001	Miscellaneous.....	39,662	45,275
Pig.....	2,056	3,190			
Scrap.....	49	65	Total.....	3,267,439	3,800,996
Live stock.....	42,947	43,488			
Metals, other, and manufactures of.....	3,177	8,162			

*Passengers arriving from and departing for foreign countries by river.*

	1905.	1906.
Arrivals.....	28,569	26,423
Departures.....	12,107	11,204
Total.....	40,676	37,627

*Comparative statement of quantity and value of exports, imports, and revenue collected.*

Year.	Exports.		Imports.		Revenue.
	Quantity.	Value.	Quantity.	Value.	
	<i>Tons.</i>		<i>Tons.</i>		
1897.....	2,599,952	\$51,760,616	1,182,807	\$27,921,738	\$14,057,074
1898.....	3,019,005	59,392,047	948,097	37,516,707	19,818,785
1899.....	3,069,570	67,044,250	1,270,440	48,241,016	20,777,735
1900.....	3,513,526	81,145,966	1,316,554	49,186,877	21,776,201
1901.....	3,183,584	79,324,344	1,279,044	51,365,142	19,046,067
1902.....	2,748,839	76,022,896	1,679,403	55,064,776	23,860,362
1903.....	2,378,307	73,184,394	1,561,082	55,516,062	21,020,331
1904.....	2,552,065	66,539,909	1,067,348	53,852,194	17,997,700
1905.....	3,267,439	70,645,103	1,365,245	67,913,822	20,022,894
1906.....	3,800,996	88,276,315	1,732,935	72,137,678	20,503,545

*Foreign entrances and clearances.*

Class.	Entered from foreign ports.		Cleared for foreign ports.		Total.	
	No.	<i>Tons.</i>	No.	<i>Tons.</i>	No.	<i>Tons.</i>
American:						
Steam vessels.....	46	60,200	43	60,043	89	120,243
Sailing vessels.....	71	33,082	75	68,601	146	101,683
Foreign:						
Steam vessels.....	1,000	2,024,158	1,006	2,078,752	2,006	4,102,910
Sailing vessels.....	97	65,806	99	77,322	196	143,128
Total.....	1,214	2,183,246	1,223	2,284,718	2,437	4,467,964

The following statement concerning the domestic and coastwise commerce of the Delaware River for the years ending December 31, 1905 and 1906, has been compiled from returns made to this office by shippers, consignees, and carriers:

Articles.	1905.		1906.	
	Quantity.	Value.	Quantity.	Value.
<b>ARRIVALS.</b>				
	<i>Tons.</i>		<i>Tons.</i>	
Asphalt .....	10,500	\$92,925	11,550	\$102,217
Bricks and terra cotta .....	21,830	56,095	14,820	49,346
Chemicals .....	104,083	2,142,055	164,818	3,794,174
Clay .....	10,819	19,369	15,000	60,000
Coal .....	611,218	1,761,913	617,089	2,236,895
Coal tar .....	10,484	43,987	21,610	129,660
Cotton .....	25,500	5,100,000	20,000	4,000,000
Fertilisers .....	94,260	1,438,065	121,602	1,971,940
Grain .....	117,224	2,908,664	188,807	3,578,188
Hay .....	88,271	622,344	2,652	27,296
Ice .....	60,777	124,564	19,729	34,462
Iron:				
Manufactured .....	128,287	3,796,156	85,114	2,960,946
Ore .....	18,812	100,716	7,700	154,000
Pig .....	65,200	848,605	80,606	1,381,338
Scrap .....	554	1,436		
Lumber .....	908,068	9,810,598	857,713	13,652,523
Manure .....	77,381	84,869	163,200	244,800
Oysters and fish .....	56,515	902,580	62,570	2,528,640
Petroleum and products .....	898,802	7,419,885	670,129	7,286,111
Produce and fruit .....	69,174	3,076,287	139,644	6,873,879
Railroad ties .....	89,306	406,530	155,338	953,614
Sand .....	1,779,712	951,912	2,062,441	1,338,378
Stone:				
Building .....	106,796	468,994	76,983	532,437
Paving .....	101,000	506,000	110,000	220,000
Sugar .....	128,060	11,497,038	181,847	10,795,368
Wood (cord) .....	102,304	398,679	81,666	285,707
Miscellaneous .....	2,867,748	761,412,371	2,528,049	628,616,080
<b>Total .....</b>	<b>8,545,135</b>	<b>815,480,007</b>	<b>8,348,627</b>	<b>691,802,969</b>
<b>DEPARTURES.</b>				
Asphalt .....	10,000	90,000	11,550	102,217
Bricks and terra cotta .....	25,621	58,628	5,506	77,890
Chemicals .....	103,572	2,098,496	79,644	2,191,711
Coal .....	7,694,946	30,402,184	7,730,543	27,206,621
Coal tar .....	25,333	151,716	8,580	19,261
Fertilisers .....	84,373	1,686,274	110,981	2,336,920
Grain .....	68,502	1,978,138	55,136	1,264,615
Hay .....	10,500	84,400	2,656	24,960
Ice .....	31,176	68,552	8,495	16,017
Iron:				
Manufactured .....	76,546	2,192,994	76,239	2,549,832
Pig .....	6,701	86,855	33,755	637,505
Ore .....	16,000	148,800	5,000	45,000
Lumber .....	48,718	282,180	46,879	678,853
Manure .....	73,228	77,861	53,106	70,971
Oysters and fish .....	206,667	2,200,768	152,040	1,822,200
Petroleum and products .....	435,663	5,305,289	409,658	5,837,218
Produce and fruit .....	4,305	432,700	71,785	3,747,450
Sand .....	896,307	508,161	826,222	468,318
Stone, building .....	255,252	1,407,474	286,094	1,282,388
Sugar .....	17,400	1,392,000	15,000	1,100,000
Wood .....	5,625	33,750	4,645	27,870
Miscellaneous .....	2,109,327	607,741,049	2,240,076	569,265,965
<b>Total .....</b>	<b>12,206,752</b>	<b>658,808,567</b>	<b>12,228,490</b>	<b>620,823,382</b>

*Passengers arriving at and departing from Philadelphia.*

	1905.	1906.
Arriving .....	1,168,584	1,476,090
Departing .....	1,168,583	1,498,144
<b>Total .....</b>	<b>2,337,117</b>	<b>2,974,234</b>

*Domestic and coastwise arrivals and departures in cargo.*

Class.	1905.		1906.	
	Arrivals.	Departures.	Arrivals.	Departures.
Steamers.....	a19,859	a19,450	a15,900	a15,868
Sailing vessels.....	3,768	b35,154	8,086	b33,086
Canal boats and barges.....	c28,000	d41,280	c37,990	d38,100
Rafts.....	365	40	239	50
Total.....	51,992	95,924	57,215	87,104

a Exclusive of tugboats and ferryboats.

b Including 30,000 oyster boats (estimated).

c Including 18,000 railroad lighters.

d Including 18,200 railroad lighters.

## SUMMARY.

*Freight movement.*

	1905.		1906.	
	Quantity.	Value.	Quantity.	Value.
Foreign:	<i>Tons.</i>		<i>Tons.</i>	
Arrivals.....	1,365,245	\$67,913,822	1,732,985	\$72,137,678
Departures.....	3,267,439	70,645,108	3,800,995	88,276,315
Domestic:				
Arrivals.....	8,545,185	915,480,007	8,348,627	691,802,989
Departures.....	12,205,752	658,808,567	12,228,490	620,323,382
Total.....	25,388,571	1,612,847,499	a26,111,047	1,472,540,364

\* Of this total quantity, 2,528,500 tons were carried on car floats between Philadelphia and Camden. It is not possible to obtain this information for the year 1905.

*Vessel movement.*

	Foreign trade.		Domestic trade.	
	1905.	1906.	1905.	1906.
ARRIVING.				
Steam vessels.....	1,316	1,386	19,869	15,900
Sailing vessels.....	790	748	8,768	3,086
Canal boats and barges.....	2,228	2,082	28,000	37,990
Rafts.....			365	239
DEPARTING.				
Steam vessels.....	1,320	1,395	19,450	15,868
Sailing vessels.....	761	716	35,154	33,086
Canal boats and barges.....	2,082	1,944	41,280	38,100
Rafts.....			40	50
Total.....	8,497	8,266	147,916	144,319

## EXPORTS OF GRAIN AND PETROLEUM.

The following tables give the amount of grain and petroleum shipped from this port during the years 1905 and 1906, compared with the shipments from other ports named:

*Export of grain (wheat and corn).*

Ports.	1905.		1906.	
	Bushels.	Per cent.	Bushels.	Per cent.
Philadelphia.....	8,956,975	6.4	15,438,875	8.4
Montreal.....	16,009,230	11.6	18,727,884	10.1
Portland.....	5,509,827	3.9	7,417,878	4.0
Boston.....	15,018,422	10.8	15,831,759	8.6
New York.....	33,606,825	24.1	40,048,573	21.5
Baltimore.....	17,547,650	12.7	29,499,152	15.9
Newport News.....	3,732,364	2.7	4,285,067	2.3
Norfolk.....	1,096,251	0.7	516,107	0.3
New Orleans.....	20,451,706	14.7	23,013,308	12.4
Galveston.....	12,847,697	9.2	28,094,970	12.5
Mobile.....	1,748,408	1.2	2,071,018	1.1
St. Johns (N. B.).....	2,877,894	2.0	5,325,221	2.9
Total.....	139,893,299	100.0	185,269,277	100.0

*Exports of petroleum (50 gallons to the barrel).*

Ports.	1905.		1906.	
	Barrels.	Per cent.	Barrels.	Per cent.
New York .....	9,243,777	49.28	8,917,462	49.59
Philadelphia .....	9,041,008	48.19	9,063,730	50.41
Baltimore .....	474,848	2.53		
Total .....	18,759,633	100.00	17,981,192	100.00

*Vessels under construction at the different shipyards along the Delaware River during the year 1906.*

	Finished.	Building.		Finished.	Building.
<b>STEEL VESSELS.</b>			<b>WOODEN VESSELS.</b>		
Battle ships .....		6	Steamboats .....	2	1
Cruisers .....	3		Revenue cutters .....		1
Steamships .....	8	14	Steam tugs .....	8	
Ice boats .....	1		Gasoline schooners .....	1	
Fishing boats .....	1		Steam barges .....	2	
Steamboats .....	2	5	Gasoline boats .....	7	
Revenue cutters .....		1	Schooners .....	3	1
Steam tugs .....	11	12	Schooner-yachts .....	1	
Wrecking steamers .....		1	Barges .....	22	13
Ferryboats .....	6	3	Car floats .....	5	2
Light-house tenders .....		1	Pontons .....	13	
Light-ships .....		5	Dredges .....	2	
Steam yachts .....	1		Pile drivers .....	1	
Dredges .....	3		Rock cutter hulls .....	4	
Gasoline boats .....	3				
Car floats .....	5	3	Total .....	71	18
Barges .....	4				
Lighters .....	2				
Total .....	50	51			

LETTER FROM MR. THEO. G. KNAUFF, SECRETARY OF THE BOARD OF HARBOR COMMISSIONERS FOR THE CITY OF PHILADELPHIA, WITH REFERENCE TO THE PROGRESS MADE BY THE CITY OF PHILADELPHIA IN THE IMPROVEMENT OF THE DELAWARE RIVER AND EXTENSION OF PIERS IN THE HARBOR OF PHILADELPHIA BY PRIVATE OWNERS DURING THE FISCAL YEAR ENDING JUNE 30, 1907, WITH TWO INCLOSURES.

BOARD OF HARBOR COMMISSIONERS FOR THE CITY OF PHILADELPHIA,  
Philadelphia, June 19, 1907.

DEAR SIR: I beg to acknowledge the receipt of your communication of June 3, 1907, in which you ask to be furnished with a concise statement regarding the progress made since June 30, 1906, by the city of Philadelphia on the reconstruction of the water front along the Delaware River and in the advancement of wharves to the new pierhead line by the city and private owners.

Under the head of the improvement of the channel of the Delaware River I would state that the only work on the deepening of this channel by the city has been under a joint appropriation of \$750,000 by the city and State, in equal shares, for work between the city line and the south line of Pennsylvania. This work has been done in part by the city by contract with the American Dredging Company and part by the United States Government plant at the expense of the city.

Under the head of the improvement of Delaware avenue nothing has been done in the way of actual construction during the year. What plans have been made for the future will be seen by the annexed papers, particularly that marked "Exhibit A," being a copy of a letter from Mr. George S. Webster, chief engineer and surveyor of the city, giving all details in connection with that and the other subjects of your inquiry.

I also inclose you herewith, marked "Exhibit B," copy of a communication from Mr. George F. Sproule, secretary of the board of port wardens, giving information in relation to the extension of piers to the new pierhead line during the year.

Very truly,

THEO. G. KNAUFF,  
Secretary.

Maj. C. A. F. FLAGLER, Corps of Engineers.

EXHIBIT A.

DEPARTMENT OF PUBLIC WORKS, BUREAU OF SURVEYS,  
Philadelphia, June 7, 1907.

DEAR SIR: Answering your letter of the 4th instant relative to the work of improving the Delaware River Harbor front I would state that during the current year nothing has been done in the way of actual construction toward this end by the city, although considerable improvement has been made by individual owners of wharf property, the records of which are not obtainable in this bureau.

I may mention, however, that under date of May 10, 1907, an ordinance was approved appropriating the sum of \$13,500,000 out of the loan authorized by ordinance of February 9, 1907, to various bureaus in the department of public works, etc. Of this there was an item of \$1,500,000 to item 30 of the bureau of surveys "for the purchase and improvement of wharves and widening Delaware avenue, subject to future legislation by councils."

Inasmuch as the legislation referred to has not been enacted, there is no definite policy outlined for the expenditure of this money.

I understand, however, that the widening of Delaware avenue referred to was to be north of Vine street to Fairmount avenue and south of South street to Washington avenue, the present width north of Vine street being 50 feet and the proposed width 150 feet and that south of South street being 80 feet, the proposed width being 150 feet.

The most of the work of harbor improvement which has been carried on by the city during the current year is that of deepening the channel of the Delaware River under the appropriation made by the city and the State, of equal shares, amounting to \$750,000. This work is being carried on in part by the United States Government plant under an agreement with the city of Philadelphia and at the expense of the latter. Other portions of the work are being carried on directly under contract with the American Dredging Company.

Yours truly,

G. S. WEBSTER, *Chief Engineer.*

MR. THEO. C. KNAUFF,  
*Secretary Board of Harbor Commissioners.*

EXHIBIT B.

BOARD OF WARDENS FOR THE PORT OF PHILADELPHIA,  
Philadelphia, June 11, 1907.

DEAR SIR: In reply to your favor of the 6th instant, would state that the following licenses have been issued by the board of wardens for the port of Philadelphia since June 30, 1906:

Chas. F. Fellin & Co., to build a wharf between Ontario and Westmoreland streets, Delaware River.

Lehigh Coal and Navigation Company, to extend to the port wardens' line, piers Nos. 75 and 76 north (Delaware River).

Very truly yours,

GEO. F. SPROULE, *Secretary.*

MR. THEO. C. KNAUFF,  
*Board of Harbor Commissioners for the City of Philadelphia.*

LETTER FROM MR. W. R. BENSON, ASSISTANT DIRECTOR, DEPARTMENT PUBLIC WORKS, CITY OF PHILADELPHIA, WITH REFERENCE TO WORK DONE IN THE IMPROVEMENT OF DELAWARE RIVER, UNDER APPROPRIATIONS MADE BY THE STATE OF PENNSYLVANIA AND CITY OF PHILADELPHIA, WITH ONE INCLOSURE.

DEPARTMENT OF PUBLIC WORKS, CITY OF PHILADELPHIA,  
Philadelphia, June 22, 1907.

DEAR SIR: Yours of the 12th instant, requesting a statement of the work done under contract with the American Dredging Company in subsections 6 A, 6 B, and 9 of the Delaware River, received.

In reply, I have the honor to inclose herewith a report made by Mr. George S. Webster, chief engineer of bureau of surveys, on this subject.

Yours very truly,

W. R. BENSON, *Assistant Director.*

Maj. C. A. F. FLAGLER, *Corps of Engineers.*



## INCLOSURE.

After it became known that the appropriation made by Congress for the improvement of the Delaware River under the 30-foot channel project was not sufficient to complete the work beyond the southerly line of the State of Pennsylvania, the legislature of the State being then in session, a bill was passed and approved May 8, 1905, for improving the channel of the Delaware River between the south line of the State of Pennsylvania and the Philadelphia Harbor, and set aside the sum of \$375,000 to be expended for this work, provided the city of Philadelphia would appropriate a like amount, the stipulation being that the work should be done under the supervision of the department of public works, bureau of surveys of the city of Philadelphia, subject to the direction of the United States engineer in charge of this district.

The city of Philadelphia, by ordinance of October 4, 1905, set aside an equal amount, making available for this work the sum of \$750,000.

Under date of July 27, 1906, after negotiations between the director of the department of public works and the engineer officer in charge of this district, an agreement was entered into whereby the War Department loaned to the city of Philadelphia a part of its dredging plant, to be operated on this improvement, under the direction of the engineer officer of this district and at the expense of the city of Philadelphia.

Work has been carried on since that time under this agreement in subsections 7 and 8, lying between the north end of Chester and the lower end of League Island.

There has been removed to date by the Government plant 778,075 cubic yards of material out of 2,072,000 cubic yards to be removed, at a total expenditure of \$92,038.97.

After several advertisements during the years 1905 and the early part of 1906, after each of which proposals were rejected, a contract was finally awarded on August 15, 1906, to the American Dredging Company of Philadelphia, for work on subsections 6 A, 6 B, and 9. Sections 6 A and 6 B, extending from the southerly line of the State of Pennsylvania to a point opposite the northern portion of Chester, excluding the rock excavation at Schooner ledge, and section 9, extending from opposite League Island to Christian street, Philadelphia, the prices being as follows:

For section 6 A, requiring the removal of 1,080,000 cubic yards, a lump sum of \$150,100.

For section 6 B, comprising the removal of 896,000 cubic yards, a lump sum of \$132,200.

For section 9, comprising 846,000 cubic yards, the lump sum of \$148,100, or a total of \$430,400.

The contract for this work was entered into October 29, 1906.

The work of constructing banks for receiving basins was undertaken during the late fall and winter, and active work began in the spring.

There has been removed from subsection 6 A prior to June 15, 1907, a total of 722,870 cubic yards, and from section 6 B 139,783 cubic yards, making a total of 862,653 cubic yards, all of which has been pumped ashore beyond high-water mark. No material has yet been removed from section 9.

The total payments on account under this contract have amounted to \$79,430.01, 10 per cent having been retained.

The limit of time for the completion of the whole of the work is June 30, 1908.

Yours truly,

G. S. WEBSTER, *Chief Engineer.*

AN ACT CEDING CERTAIN SUBMERGED LANDS IN THE DELAWARE RIVER TO THE UNITED STATES BY THE STATE OF DELAWARE AND JURISDICTION OVER SAME, EXCEPT SO FAR AS THE EXECUTION OF ALL CIVIL AND CRIMINAL PROCESS ISSUED UNDER ANY LAW OF THE STATE.

AN ACT To cede certain lands to the United States of America.

*Be it enacted by the Senate and House of Representatives of the State of Delaware in General Assembly met:*

SECTION 1. That all the right, title, interest, and property of this State in and to certain submerged land in the Delaware River between the States of Delaware and New Jersey, the location of said land, with reference to the United States Engineer Department triangulation of the said river, being more specially described as follows:

Beginning at a point A in said land distant four thousand three hundred and fifteen feet from triangulation station Stony Point on a line south sixty-five (65) degrees, forty-one (41) minutes west therefrom; this point A being also north sixty-two (62) degrees, fifty (50) minutes, and twenty-six (26) seconds west, ten thousand eight hundred fifteen and nine-tenths (10,815.9) feet from triangulation station Hope; thence from A north seven (7) degrees and thirty-three (33) minutes west, two thousand and six and two-tenths (2,006.2) feet to B; thence north five (5) degrees and forty-seven (47) minutes west, three hundred eighty-two and six-tenths (382.6) feet to C; thence from C north three (3) degrees fifty-three (53) minutes west; eight thousand one hundred and fifty-five (8,155) feet to D; thence from D north seven (7) degrees, forty-nine (49) minutes, and twenty (20) seconds west, four thousand five hundred and nineteen (4,519) feet to E; the beginning of a curve the degree of which is thirty (30) degrees, eleven (11) minutes, and twenty-five (25) seconds and which covers a central angle of one hundred and fifty-two (152) degrees, four (4) minutes, and ten (10) seconds to F. The bearing and length of the chord from E to F is north eighty-three (83) degrees, fifty-one (51) minutes, and twenty-five (25) seconds west, three hundred and seventy-two and six-tenths (372.6) feet. Point E is also south eighty-three (83) degrees, fifty-two (52) minutes, and forty-five (45) seconds west, two thousand eight hundred twelve and seventy-six hundredths (2,812.76) feet from triangulation station Alloway Creek; thence from F south twenty (20) degrees, six (6) minutes, and thirty (30) seconds west, one thousand one hundred and five (1,105) feet to G; thence from G south eleven (11) degrees, thirty-one (31) minutes, west, six hundred and eighty-three (683) feet to H; thence from H south four (4) degrees, twenty (20) minutes, and ten (10) seconds west, six thousand seven hundred and forty-seven (6,747) feet to K; thence from K south seven (7) degrees, seventeen (17) minutes, and thirty (30) seconds east, two thousand nine hundred twenty-two and six-tenths (2,922.6) feet to M; thence from M along a fifty-nine (59) minute curve, covering a central angle of twenty-five (25) degrees and twenty-eight (28) minutes to N. The bearing and length of the chord from M to N is south twenty (20) degrees and three (3) minutes east, two thousand five hundred and sixty-eight and four-tenths (2,568.4) feet; thence from N south thirty-two (32) degrees forty-seven (47) minutes east, one thousand eight hundred nine and eight-tenths (1,809.8) feet to O; thence from O along a sixteen (16) degree, twenty-five (25) minute, and thirty-six (36) seconds, curve, covering a central angle of one hundred and fifty-four (154) degrees and forty-six (46) minutes to A, the place of beginning. The bearing and length of the chord from O to A, the place of beginning, is north sixty-nine (69) degrees and fifty (50) minutes east, six hundred and eighty-three and one-tenth (683.1) feet, containing five hundred and eighty-three (583) acres, more or less, shall be, and hereby are, ceded to and vested in the United States of America as fully, absolutely, and to the same extent as this State now holds and is entitled to the same, together with the jurisdiction thereof.

SEC. 2. That the sovereignty and jurisdiction of this State shall extend over the land hereby ceded to and vested in the United States of America so far as that all civil and criminal process issued under any law of this State may be executed in any part of said land and in any building now erected or that may hereafter be erected on said land.

ISAAC T. PARKER,  
*President of the Senate.*  
RICHARD HODGSON,  
*Speaker of the House.*

Approved this the fourth day of April, A. D. 1907.

PRESTON LEA, *Governor.*

AN ACT AUTHORIZING THE GOVERNOR OF THE STATE OF NEW JERSEY TO CEDE TO THE UNITED STATES CERTAIN SUBMERGED LANDS IN THE DELAWARE RIVER, PASSED BY THE LEGISLATURE OF THE STATE.

*Chapter 20, Laws 1907, State of New Jersey.*

AN ACT Authorizing the governor to cede to the United States certain lands under water in the Delaware River for the purpose of aiding in the improvement of said river.

Whereas, The Federal Government is engaged in dredging and otherwise improving the bed of the Delaware River under authority of Congress, and in

the course of such improvement it has been found necessary for the Government to construct a bulkhead around portions of what are known as "Dan Baker" and "Stony Point" shoals so as to form a basin within which to deposit the material dredged from the channel; and whereas, when completed this area will form an island which it is thought important to have in the possession and under the control of the Federal Government; and whereas, the Government of the United States desires to acquire title to that portion of the river bottom of the Delaware river in which the aforesaid island is to be constructed; therefore,

*Be it enacted by the senate and general assembly of the State of New Jersey:*

1. The Governor of this State be and he hereby is authorized and directed to cede jurisdiction over and convey to the United States all the right, title and interest of this State in and to certain submerged land in the Delaware river, between the States of Delaware and New Jersey, the location whereof with reference to the United States Engineer Department triangulation of the said river, is more particularly described as follows:

Beginning at a point A in said land distant four thousand three hundred and fifteen feet from triangulation station Stony Point on a line south, sixty-five (65) degrees forty-one (41) minutes west, therefrom; this point A being also north, sixty-two (62) degrees fifty (50) minutes and twenty-six (26) seconds west, ten thousand eight hundred and fifteen and nine-tenths (10815.9) feet from triangulation station Hope; thence from A north, seven (7) degrees and thirty-three (33) minutes west, two thousand and six and two-tenths (2006.2) feet to B; thence north, five (5) degrees and forty-seven (47) minutes west, three hundred eighty-two and six-tenths (382.6) feet to C; thence from C north three (3) degrees fifty-three (53) minutes west, eight thousand one hundred and fifty-five (8155) feet to D; thence from D north, seven (7) degrees forty-nine (49) minutes and twenty (20) seconds west, four thousand five hundred and nineteen (4519) feet to E, the beginning of a curve the degree of which is thirty (30) degrees eleven (11) minutes and twenty-five (25) seconds, and which covers a central angle of one hundred and fifty-two (152) degrees four (4) minutes and ten (10) seconds to F. The bearing and length of the chord from E to F is north, eighty-three (83) degrees fifty-one (51) minutes and twenty-five (25) seconds west, three hundred and seventy-two and six-tenths (372.6) feet. Point E is also south, eighty three (83) degrees fifty-two (52) minutes and forty-five (45) seconds west, two thousand eight hundred and twelve and seventy-six hundredths (2812.76) feet from triangulation station Alloway creek; thence from F south, twenty (20) degrees six (6) minutes and thirty (30) seconds west, one thousand one hundred and five (1105) feet to G; thence from G south, eleven (11) degrees thirty-one (31) minutes west, six hundred and eighty-three (683) feet to H; thence from H south, four (4) degrees twenty (20) minutes and (10) seconds west, six thousand seven hundred and forty-seven (6747) feet to K; thence from K south, seven (7) degrees seventeen (17) minutes and thirty (30) seconds east, two thousand nine hundred and twenty-two and 6-tenths (2922.6) feet to M; thence from M along a fifty-nine (59) minute curve, covering a central angle of twenty-five (25) degrees and twenty-eight (28) minutes to N. The bearing and length of the chord from M to N is south, twenty (20) degrees and three (3) minutes east, two thousand five hundred and sixty-eight and four-tenths (2568.4) feet; thence from N south, thirty-two (32) degrees forty-seven (47) minutes east, one thousand eight hundred and nine and eight-tenths (1809.8) feet to O; thence from O along a sixteen (16) degree twenty-five (25) minutes and thirty-six (36) seconds curve, covering a central angle of one hundred and fifty-four (154) degrees and forty-six (46) minutes to A, the place of beginning. The bearing and length of the chord from O to A, the place of beginning, is north, sixty-nine (69) degrees and fifty (50) minutes east, six hundred and eighty-three and one-tenth (683.1) feet.

2. The sovereignty and jurisdiction of this State over the land herein authorized to be conveyed is hereby retained so far as that all civil and criminal process issued under authority of any law of this State may be executed in any part of the premises so conveyed.

3. This act shall take effect immediately.

Approved, March 29, 1907.

AN ACT CEDING JURISDICTION TO THE UNITED STATES OVER THE ABOVE LANDS, EXCEPT FOR CERTAIN PURPOSES NAMED IN THE ACT, WHICH ARE RETAINED BY THE STATE OF NEW JERSEY.

*Chapter 19, Laws 1907, State of New Jersey.*

AN ACT Ceding to the United States jurisdiction over lands acquired for public purposes within this State.

*Be it enacted by the senate and general assembly of the State of New Jersey:*

1. The consent of the State of New Jersey is hereby given pursuant to the provisions of article one, section eight, paragraph seventeen, of the Constitution of the United States, to the acquisition by the United States, by purchase, condemnation or otherwise, of any land within this State, for the erection of dockyards, custom houses, court houses, or post offices, or other needful buildings.

2. Exclusive jurisdiction in and over any land so acquired by the United States is hereby ceded to the United States for all purposes except the service of process issued out of any of the courts of this State in any civil or criminal proceeding, but such jurisdiction shall continue only so long as the United States shall retain ownership of said lands.

3. The jurisdiction hereby ceded shall not vest until the United States shall have actually acquired ownership of said lands, and so long as said lands shall remain in the ownership of the United States the same shall be exempt from any and all taxes, assessments or other charges leviable by this State or any of its municipalities.

4. This act shall take effect immediately.

Approved, March 29, 1907.

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INDENTURE BY THE GOVERNOR OF THE STATE OF NEW JERSEY, CONVEYING THE LANDS TO THE UNITED STATES, IN ACCORDANCE WITH THE AUTHORIZATION AND DIRECTIONS CONTAINED IN THE ABOVE ACT.

Whereas the Legislature of the State of New Jersey, by an act approved the twenty-eighth day of March, nineteen hundred and seven, entitled "An Act authorizing the Governor to cede to the United States certain lands under water in the Delaware River for the purpose of aiding in the improvement of said river," did authorize and direct the Governor of the State of New Jersey to cede jurisdiction over and to convey to the United States of America all the right, title and interest of the State of New Jersey in and to certain submerged land in the Delaware river, between the States of Delaware and New Jersey herein-after particularly described.

Now therefore, this indenture, made this twenty-first day of May, in the year of our Lord, one thousand nine hundred and seven, between Edward C. Stokes, Governor of the State of New Jersey, party of the first part, and the United States of America, party of the second part, witnesseth:

The party of the first part, in pursuance of the power and authority vested in said party of the first part by the act of the Legislature above recited, has given, granted, bargained, sold, aliened, remised, released, conveyed and confirmed, and by these presents does give, grant, bargain, sell, alien, remise, release, convey and confirm unto the United States of America, its successors and assigns, all the right, title and interest of the State of New Jersey in and to certain submerged land in the Delaware River between the States of Delaware and New Jersey, the location whereof with reference to the United States Engineer Department triangulation of the said river, is more particularly described as follows:

Beginning at a point A in said land distant four thousand three hundred and fifteen feet from triangulation station Stony Point on a line south, sixty-five (65) degrees forty-one (41) minutes west, therefrom; this point A being also north, sixty-two (62) degrees fifty (50) minutes and twenty-six (26) seconds west, ten thousand eight hundred and fifteen and nine-tenths (10,815.9) feet from triangulation station Hope; thence from A north, seven (7) degrees and thirty-three (33) minutes west, two thousand and six and two-tenths (2,006.2) feet to B; thence north, five (5) degrees and forty-seven (47) minutes west, three hundred eighty-two and six-tenths (382.6) feet to C; thence from C north, three (3) degrees fifty-three (53) minutes west; eight thousand one hun-

dred and fifty-five (8,155) feet to D; thence from D north, seven (7) degrees forty-nine (49) minutes and twenty (20) seconds west, four thousand five hundred and nineteen (4,519) feet to E, the beginning of a curve the degree of which is thirty (30) degrees eleven (11) minutes and twenty-five (25) seconds, and which covers a central angle of one hundred and fifty-two (152) degrees four (4) minutes and ten (10) seconds to F. The bearing and length of the chord from E to F is north, eighty-three (83) degrees fifty-one (51) minutes and twenty-five (25) seconds west, three hundred and seventy-two and six-tenths (372.6) feet. Point E is also south, eighty-three (83) degrees, fifty-two (52) minutes and forty-five (45) seconds west, two thousand eight hundred and twelve and seventy-six hundredths (2,812.76) feet from triangulation station Alloway creek; thence from F south, twenty (20) degrees six (6) minutes and thirty (30) seconds west, one thousand one hundred and five (1,105) feet to G; thence from G south, eleven (11) degrees thirty-one (31) minutes west, six hundred and eighty-three (683) feet to H; thence from H south, four (4) degrees twenty (20) minutes and ten (10) seconds west, six thousand seven hundred and forty-seven (6,747) feet to K; thence from K south, seven (7) degrees seventeen (17) minutes and thirty (30) seconds east, two thousand nine hundred and twenty-two and six-tenths (2,922.6) feet to M; thence from M along a fifty-nine (59) minute curve, covering a central angle of twenty-five (25) degrees and twenty-eight (28) minutes to N. The bearing and length of the chord from M to N is south, twenty (20) degrees and three (3) minutes east, two thousand five hundred and sixty-eight and four-tenths (2,568.4) feet; thence from N south, thirty-two (32) degrees forty-seven (47) minutes east, one thousand eight hundred and nine and eight-tenths (1,809.8) feet to O; thence from O along a sixteen (16) degree twenty-five (25) minute and thirty-six (36) seconds curve, covering a central angle of one hundred and fifty-four (154) degrees and forty-six (46) minutes to A, the place of beginning. The bearing and length of the chord from O to A, the place of beginning, is north, sixty-nine (69) degrees and fifty (50) minutes east, six hundred and eighty-three and one-tenth (683.1) feet.

Together with all and singular the rights, liberties, privileges, hereditaments and appurtenances to the same belonging or appertaining, and also all the estate, right, title, interest, property, claim and demand whatsoever, both at law and in equity, of the said party of the first part, of, in and to the said premises, with the appurtenances; to have and to hold the above-mentioned and described premises, with the appurtenances, unto the said party of the second part, its successors and assigns, to the only proper use, benefit and behoof of the said party of the second part, its successors and assigns forever.

The jurisdiction of the State of New Jersey over all of the above-described land is hereby ceded to the United States of America except that the State of New Jersey retains its sovereignty and jurisdiction over the land herein conveyed so far as that all civil and criminal process issued under authority of any law of the State of New Jersey may be executed in any part of the premises hereby conveyed.

In witness whereof the party of the first part has hereunto set his hand and seal the day and year first above written.

[SEAL.]

E. C. STOKES,  
*Governor of the State of New Jersey.*

Signed, sealed and delivered in the presence of

THEODORE BACKUS.

STATE OF NEW JERSEY, *County of Mercer, ss:*

Be it remembered that on this twenty-first day of May, in the year of our Lord one thousand nine hundred and seven, before the subscriber, a master in chancery of the State of New Jersey, personally appeared Edward C. Stokes, governor of said State, who, I am satisfied, is the person named in and who executed the foregoing deed of conveyance, and I having first made known to him the contents thereof, he did thereupon acknowledge that he signed, sealed, and delivered the same as his voluntary act and deed as governor of the State of New Jersey, in pursuance of the power and authority vested in him by an act of the legislature of said State.

THEODORE BACKUS,  
*Master in Chancery of the State of New Jersey.*

## H 2.

## IMPROVEMENT OF DELAWARE RIVER AT PERRIWIG BAR, NEW JERSEY AND PENNSYLVANIA.

The approved project for the expenditure of available funds provides for dredging a channel 7 feet deep at mean low water with a bottom width of 200 feet, in three straight stretches through Perriwig bar, at an estimated cost of \$50,000.

During the past fiscal year a new survey was made of this locality to determine any changes that might have occurred, and specifications for the dredging were prepared and submitted with the view to advertising for proposals for the work to be done. At the close of the fiscal year the specifications had not been finally approved.

The amount expended at this locality during the past fiscal year was \$530.29.

*Money statement.*

Amount appropriated by river and harbor act approved March 2, 1907.	\$50, 000. 00
June 30, 1907, amount expended during fiscal year, for works of improvement -----	530. 29
July 1, 1907, balance unexpended -----	49, 469. 71
<hr/>	
{ Amount that can be profitably expended in fiscal year ending June 30, 1909, for maintenance of improvement, in addition to the balance unexpended July 1, 1907 -----	1, 500. 00
{ Submitted in compliance with requirements of sundry civil act of June 4, 1897, and of section 7 of the river and harbor act of 1899.	

---

APPROPRIATION.

March 2, 1907 ----- \$50,000

## H 3.

## IMPROVEMENT OF HARBOR BETWEEN PHILADELPHIA, PENNSYLVANIA, AND CAMDEN, NEW JERSEY.

An account of this improvement is contained in the Annual Reports of the Chief of Engineers for 1896, page 897; 1897, page 1205; 1898, page 1085; 1899, page 1328; 1900, page 1566; and 1906, page 1038.

The U. S. dredge *Delaware* was placed on the work of dredging shoal places within limits of this harbor June 6, 1906, and to the close of the fiscal year of 1906 excavated and removed 98,432 cubic yards of material. During the past fiscal year in the month of July the same dredge excavated and removed a further quantity of 10,968 cubic yards, making the total quantity removed under the allotment of \$10,000 from the appropriation of March 3, 1905, 109,400 cubic yards, all of which was deposited in front of the U. S. rehandling machine *Cataract* at Mifflin bar and pumped ashore behind the dike at that locality.

The total cost of this work was \$9,992.94, the sum of \$7.06 being redeposited to the credit of the appropriation.

*Money statement.*

July 1, 1906, balance unexpended from allotment of \$10,000 from appropriation for emergencies in river and harbor works, act of March 3, 1905.....	\$7, 292. 70
June 30, 1907, amount expended during fiscal year, for maintenance of improvement.....	7, 269. 97
July 1, 1907, balance unexpended.....	22. 73
July 1, 1907, outstanding liabilities.....	15. 67
July 1, 1907, balance available, returned to appropriation.....	7. 06
<hr/>	
{ Amount that can be profitably expended in fiscal year ending June 30, 1909, for maintenance of improvement, in addition to the balance unexpended July 1, 1907.....	40, 000. 00
{ Submitted in compliance with requirements of sundry civil act of June 4, 1897, and of section 7 of the river and harbor act of 1899.	

## APPROPRIATIONS.

August 11, 1888 .....	\$500, 000	March 2, 1895.....	\$850, 000
September 19, 1890.....	200, 000	June 11, 1896.....	600, 000
March 3, 1891.....	300, 000	June 4, 1897.....	694, 000
August 5, 1892.....	41, 000	March 3, 1905 (allotment) ..	10, 000
March 3, 1893.....	500, 000		
August 18, 1894.....	250, 000	Total .....	\$3, 945, 000

## H 4.

## IMPROVEMENT OF ICE HARBOR AT MARCUSHOOK, PENNSYLVANIA.

An account of this improvement is contained in the Annual Reports of the Chief of Engineers for 1896, page 920; 1900, page 1574; and 1904, page 1196.

The protection works for this harbor consist of the old landing piers and seven detached piers having foundations of wooden cribs filled with stone, the superstructures being filled with cut stone.

There were no expenditures during the past fiscal year and no liabilities were incurred.

*Money statement.*

July 1, 1906, balance unexpended.....	\$37. 54
July 1, 1907, balance unexpended.....	37. 54

## APPROPRIATIONS.

June 23, 1866 .....	\$5, 000	August 5, 1886.....	\$15, 000
March 2, 1867.....	94, 000	August 11, 1888.....	15, 000
January 14, 1880.....	35, 000	September 19, 1890.....	5, 000
March 2, 1881.....	30, 000		
August 2, 1882.....	15, 000	Total .....	214, 000

\* Of this amount, \$87.24 was carried to the surplus fund.

## H 5.

CONSTRUCTION OF IRON PIER IN DELAWARE BAY, NEAR LEWES.  
DELAWARE.

An account of this work is contained in the Annual Reports of the Chief of Engineers for 1896, page 920, and for 1900, page 1574.

During the past fiscal year no work has been done or liabilities incurred.

The funds now available are considered sufficient for present needs.

*Money statement.*

July 1, 1906, balance unexpended.....	\$820. 60
July 1, 1907, balance unexpended.....	820. 60

## APPROPRIATIONS.

July 15, 1870.....	\$225, 000	June 14, 1880.....	\$10, 000
June 23, 1874.....	10, 000	March 3, 1881.....	10, 000
March 3, 1875.....	25, 000	August 2, 1882.....	13, 000
March 3, 1875.....	15, 000	April 4, 1890.....	10, 000
August 14, 1876.....	30, 000	June 3, 1896.....	7, 600
June 18, 1878.....	20, 000		
March 3, 1879.....	10, 500	Total .....	386, 160

## H 6.

## IMPROVEMENT OF DELAWARE BREAKWATER, DELAWARE.

An account of this improvement is contained in the Annual Reports of the Chief of Engineers for 1896, page 922; for 1897, page 1214; for 1898, page 1094; for 1901, page 1323, and for 1905, page 1083.

During the past fiscal year no work has been done nor expenses incurred.

The funds now available are considered sufficient for present needs.

The commercial statistics of the harbor at and in the vicinity of this breakwater are given in connection with the report on the harbor of refuge, Delaware Bay, Delaware.

*Money statement.*

July 1, 1906, balance unexpended.....	\$875. 64
July 1, 1907, balance unexpended.....	875. 64

## APPROPRIATIONS.

May 7, 1822.....	\$22, 700. 00	August 2, 1882.....	\$125, 000. 00
May 23, 1828.....	250, 000. 00	July 5, 1884.....	75, 000. 00
April 23, 1830.....	162, 000. 00	August 5, 1886.....	56, 250. 00
March 2, 1831.....	208, 000. 00	August 11, 1888.....	100, 000. 00
July 3, 1832.....	270, 000. 00	September 19, 1890.....	80, 000. 00
March 3, 1833.....	270, 000. 00	July 13, 1892.....	50, 000. 00
June 28, 1834.....	270, 000. 00	August 18, 1894.....	50, 000. 00
March 3, 1835.....	100, 000. 00	June 3, 1896.....	80, 000. 00
July 2, 1836.....	100, 000. 00		
July 4, 1836 (survey).....	1, 000. 00	Total .....	2, 808, 353. 70
March 3, 1837.....	141, 000. 00	Received from sale of old building.....	1. 00
July 7, 1838.....	150, 000. 00		
August 30, 1852.....	30, 000. 00	Grand total .....	2, 808, 354. 70
June 23, 1866.....	107, 910. 00		
March 2, 1867.....	109, 493. 70		



## H 7.

CONSTRUCTION OF HARBOR OF REFUGE, DELAWARE BAY,  
DELAWARE.

An account of this improvement is contained in the Annual Reports of the Chief of Engineers for 1897, page 1216; for 1901, page 1325; for 1902, page 1036; for 1903, page 970, and for 1904, page 1199.

During the past fiscal year no work was done or liabilities incurred.

The available funds are held for examinations, maintenance, and repairs.

*Money statement.*

July 1, 1906, balance unexpended	\$1, 128. 66
July 1, 1907, balance unexpended	1, 128. 66

## APPROPRIATIONS.

June 3, 1896	\$5, 000	June 6, 1900	\$450, 000
June 4, 1897	394, 334	March 3, 1901	213, 000
July 1, 1898	800, 000		
March 3, 1899	377, 000	Total	2, 239, 334

## COMMERCIAL STATISTICS.

*Arrivals at Delaware breakwater during 1906.*

	Steamers.	Ships.	Barks.	Brigs.	Schooners.	Barges.	Total.
For orders	33	2	11		11		57
For harbor	30	3	24		521	359	987
In distress			2		8		10
Total	63	5	37		540	359	1, 004

## H 8.

## REMOVING SUNKEN VESSELS OR CRAFT OBSTRUCTING OR ENDANGERING NAVIGATION.

(1) On April 22, 1904, the barge *Alice* was sunk by collision in the Delaware River near Tinicum Island. The wreck being considered an obstruction to navigation, its removal was recommended. Sealed proposals were opened July 8, 1904. All the bids were rejected, the prices offered being considered too high. Nothing further has been done in regard to the removal of this wreck. It is proposed to remove the wreck by the use of United States plant.

(2) Under date of January 12, 1906, Mr. William Hagen, of Philadelphia, gave notice that he was the owner of a ponton sunk in the eastern channel of Delaware River, about 500 feet from the end of the wharf below Mercer street, Gloucester, N. J., and that he had abandoned the wreck for removal by the United States. An examination of the wreck was made and, it having been found to be an obstruction to navigation, its removal was recommended. Sealed proposals for removal of the wreck were opened on March 12, 1906, and rejected, the prices being considered as excessive for the work to be done, the lowest of the bids being for the sum of \$635. The wreck was removed by the use of plant belonging to the United States and employment

of hired labor, the work being completed on August 9, 1906, at a total cost of \$457.01.

(3) A canal boat loaded with clay, sunk about four years ago, was found lying in Delaware River along the inshore side of the lower inner ice pier at New Castle, Del. The wreck was found to be a dangerous menace to navigation and its removal was recommended. Under date of July 13, 1906, a contract was entered into with Charles W. Johnston, of Lewes, Del., for removal of all parts of the wreck and contents from the waterway for the sum of \$319. The work of removal was completed on July 21, 1906.

(4) Under date of July 1, 1906, the inspector of the fourth light-house district, reported the existence of the wreck of the schooner *Hampton*, lying in Delaware Bay between Cross Ledge Light Station and Fortescue beach. The wreck having been found to be a dangerous obstruction to navigation, its removal was recommended. Under date of August 31, 1906, a contract was entered into with Ebe T. Lynch & Co., of Lewes, Del., for removal of all parts of the wreck and contents from the waterway for the sum of \$295. The work of removal was completed on September 28, 1906.

## H 9.

### CONSTRUCTION OF HYDRAULIC DREDGES.

#### SEAGOING DREDGES.

##### 1. DREDGE FOR IMPROVING HARBOR AT PENSACOLA, FLA.

For work previously performed under contract for a wooden hull, single-screw suction dredge, see page 977, Annual Report of the Chief of Engineers for 1903; page 1207, Annual Report of the Chief of Engineers for 1904; pages 1090 and 1901, Annual Report of the Chief of Engineers for 1905, and pages 1045 and 1046, Annual Report of the Chief of Engineers for 1906.

The defects for the dredge *Caucus*, noted in the Annual Report for 1906, have been remedied at the navy-yard at Pensacola, Fla. The question of the amount to be charged the contractors on account of these defects has caused considerable correspondence and has not yet been fully decided.

Total amount expended to June 30, 1907, including cost of construction, inspection, outfit, and voyage from New York to Pensacola, Fla., was \$171,378.39.

#### *Money statement.*

June 30, 1907, amount drawn.....	\$178,000.00
Amount expended to June 30, 1906.....	\$168,217.29
June 30, 1907, amount expended during fiscal year.....	3,161.10
	<hr/> 171,378.39
	4,621.61
November 3, 1906, amount deposited to credit of appropriation, funds not needed.....	3,000.00
	<hr/> 1,621.61
July 1, 1907, balance unexpended.....	<hr/> 1,621.61
July 1, 1907, amount held for payment of outstanding liabilities, when question of amount properly chargeable to contractors is decided.....	1,621.61

## 2. DREDGE FOR IMPROVING DELAWARE RIVER, PENNSYLVANIA AND NEW JERSEY.

For work previously performed under contract for a twin-screw, steel-hull, suction dredge, see pages 1214 and 1215, Annual Report of the Chief of Engineers for 1904; page 1096 Annual Report of the Chief of Engineers for 1905, and pages 1048 and 1049 Annual Report of the Chief of Engineers for 1906.

At the beginning of the year the dredge had been accepted, delivered, and was at work on the Delaware River.

Total amount expended to June 30, 1907, including cost of construction, inspection, outfit, and voyage from Sparrows Point, Md., to Philadelphia, Pa., via Wilmington, N. C., was \$387,434.91.

### *Money statement.*

June 30, 1907, amount drawn.....	\$400,000.00
Amount expended to June 30, 1906.....	\$321,608.92
June 30, 1907, amount expended during fiscal year.....	65,825.99
	<u>387,434.91</u>
	<u>12,565.09</u>
October 23, 1906, amount deposited to credit of appropriation, funds not needed .....	12,565.09

## 3. DREDGE FOR IMPROVING LOWER WILLAMETTE AND COLUMBIA RIVER, OREGON AND WASHINGTON.

The river and harbor act approved March 2, 1907, contains an appropriation of \$300,000 for improving the lower Willamette and Columbia rivers below Portland, Oreg., to be expended in the construction and operation of a dredge.

During the past fiscal year the plans and specifications for a single-screw, steel-hull, suction dredge for this improvement were prepared, submitted, and approved. Proposals were invited by public advertisement, and the lowest bid received, that of the Newport News Shipbuilding and Dry Dock Company, at the price of \$234,500 for constructing the dredge and delivering it at Newport News, Va., was accepted. The contract for this work has not yet been executed.

The following bids were received for constructing the dredge and delivering it at point of construction:

The Moran Company, Seattle, Wash.....	\$285,000
Maryland Steel Company, Sparrow Point, Md.....	239,850
Newport News Shipbuilding and Dry Dock Company, Newport News, Va .....	234,500

The amount expended to June 30, 1907, in the preparation of the plans for the dredge, trip of mechanical engineer to Portland, Oreg., and return to Philadelphia, Pa., job printing, etc., was \$1,167.32.

*Money statement.*

June 30, 1907, amount allotted and drawn from appropriation of March 3, 1906, for preparation of plans, etc., of dredge.....	\$2,000.00
June 30, 1907, amount expended.....	1,167.32
July 1, 1907, balance unexpended.....	832.68
July 1, 1907, outstanding liabilities.....	79.40

## 4. DREDGES FOR IMPROVING NEW YORK HARBOR, NEW YORK.

The river and harbor act approved March 2, 1907, contains authority for the completion of the project for improving Ambrose channel, New York Harbor, to be paid for as appropriations may from time to time be made by law, to an amount not exceeding \$1,148,510, exclusive of amounts before appropriated or authorized, from which amount, or from any amounts before appropriated or authorized, not exceeding \$800,000 may be expended for the construction of two suction dredges.

The plans and specifications for two twin-screw, steel-hull, suction dredges for this improvement were prepared and submitted for approval under date of June 26, 1907, with the view to advertising for proposals for constructing the dredges. At the close of the past fiscal year these plans had not been approved.

The total amount expended in the preparation of the plans and specifications for these dredges to June 30, 1907, was \$929.11.

*Money statement.*

June 30, 1907, amount drawn.....	\$2,500.00
June 30, 1907, amount expended.....	929.11
July 1, 1907, balance unexpended.....	1,570.89

## NONSEAGOING DREDGE.

## 5. DREDGE FOR IMPROVING HARBOR AT SAVANNAH, GA.

The river and harbor act approved March 2, 1907, contains an appropriation of \$300,000 for the improvement of the harbor of Savannah, Ga., authorizes contracts for a further sum of \$700,000, and provides for the construction of a dredge of the stationary pumping type, at a cost not to exceed \$125,000.

The preparation of the plans for a steel-hull dredge of the type required for use in the improvement of Savannah Harbor was in progress at the close of the past fiscal year, about 60 per cent of the work having been completed at that date.

The total amount expended on the work of preparing the plans of the dredge to June 30, 1907, was \$171.67.

*Money statement.*

June 30, 1907, amount drawn.....	\$2,000.00
June 30, 1907, amount expended.....	171.67
July 1, 1907, amount unexpended.....	1,828.33

## APPENDIX I.

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### IMPROVEMENT OF RIVERS AND HARBORS IN SOUTHERN NEW JERSEY AND OF CERTAIN RIVERS AND HARBORS IN DELAWARE.

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REPORT OF MAJ. C. A. F. FLAGLER, CORPS OF ENGINEERS, OFFICER IN CHARGE, FOR THE FISCAL YEAR ENDING JUNE 30, 1907.

#### IMPROVEMENTS.

- |                                   |  |
|-----------------------------------|--|
| 1. Rancocas River, New Jersey.    | 10. Wilmington Harbor, Delaware.       |
| 2. Cooper Creek, New Jersey.      | 11. Appoquinimink, Murderkill, and     |
| 3. Mantua Creek, New Jersey.      | Mispillion rivers, Delaware.           |
| 4. Raccoon Creek, New Jersey.     | 12. St. Jones River, Delaware.         |
| 5. Salem River, New Jersey.       | 13. Smyrna River, Delaware.            |
| 6. Alloway Creek, New Jersey.     | 14. Broadkill River, Delaware.         |
| 7. Cohansey River, New Jersey.    | 15. Removing sunken vessels or craft   |
| 8. Tuckerton Creek, New Jersey.   | obstructing or endangering navigation. |
| 9. Cold Spring Inlet, New Jersey. |  |
- 

ENGINEER OFFICE, UNITED STATES ARMY,  
*Wilmington, Del., July 10, 1907.*

GENERAL: I have the honor to inclose herewith annual report for the works of river and harbor improvement in this district for the fiscal year ending June 30, 1907.

Very respectfully, your obedient servant,

C. A. F. FLAGLER,  
*Major, Corps of Engineers.*

Brig. Gen. A. MACKENZIE,  
*Chief of Engineers, U. S. A.*

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#### I 1.

#### IMPROVEMENT OF RANCOCAS RIVER, NEW JERSEY.

For the history of this improvement see the Annual Report of the Chief of Engineers for 1907, Part 1, page 185.

Nothing was done on this improvement during the past fiscal year.  
No contract in force.

It was impracticable to obtain commercial statistics.

*Money statement.*

July 1, 1906, balance unexpended.....	\$20. 76
July 1, 1907, balance unexpended.....	20. 76

## APPROPRIATIONS.

## BELOW THE FORKS.

March 3, 1881.....	\$10, 000
August 2, 1882.....	10, 000
September 19, 1890.....	10, 000
	<u>\$30, 000</u>

## MOUNT HOLLY BRANCH.

July 13, 1892.....	5, 000
August 18, 1894.....	3, 000
	<u>8, 000</u>

## LUMBERTON BRANCH.

June 3, 1896.....	2, 000
March 3, 1899.....	2, 000
June 13, 1902.....	3, 000
	<u>7, 000</u>

Total.....	<u>45, 000</u>
------------	----------------

Carried to surplus fund in July, 1890.....	100. 09
Carried to surplus fund in July, 1905.....	<u>* 399. 70</u>

## I 2.

## IMPROVEMENT OF COOPER CREEK, NEW JERSEY.

For the history of this improvement see the Annual Report of the Chief of Engineers for 1907, Part 1, page 186.

Under a project approved by the Chief of Engineers July 20, 1906, emergency contract dated September 21, 1906, was entered into with the River and Harbor Improvement Company, of Camden, N. J., the lowest bidder, for dredging, at 24 cents per cubic yard, measured in place, and work under it was begun September 27 and continued to October 17, 1906, when it was completed. The channel was dredged between the 12-foot curve in the Delaware River and the State Street Bridge, to a depth of 13 feet at mean low water, which included an allowance of 1 foot for overdepth, and a width of 70 feet with side slopes of one on one. The quantity of material removed was 19,969 cubic yards, place measurement, and consisted of mud, which was scowed away and deposited ashore above the high-water line in Line Ditch, South Camden, N. J. This was for maintenance. No work was done above State street owing to the presence of a water main crossing the stream at that point. The city authorities have now, it is stated, entered into a contract for lowering the pipe, under which operations are to be begun early in July, 1907.

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\* Pertains to Mount Holly Branch.

*Money statement.*

July 1, 1906, balance unexpended.....	\$8,602. 20
June 30, 1907, amount expended during fiscal year, for maintenance of improvement .....	5,072. 96
July 1, 1907, balance unexpended.....	3,529. 24
Amount (estimated) required for completion of existing project.....	5,072. 96
Amount that can be profitably expended in fiscal year ending June 30, 1909, in addition to the balance unexpended July 1, 1907:	
For works of improvement.....	\$5,072. 96
For maintenance of improvement.....	4,000. 00
	9,072. 96
Submitted in compliance with requirements of sundry civil act of June 4, 1897, and of section 7 of the river and harbor act of 1899.	

*APPROPRIATION.*

June 3, 1896.....	\$37,000
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*CONTRACT IN FORCE.*

Emergency contract with the River and Harbor Improvement Company of Camden, N. J., dated September 21, 1906, for dredging, at 24 cents per cubic yard, place measurement, work to be begun October 1 and completed December 1, 1906.

*COMMERCIAL STATISTICS FOR CALENDAR YEAR ENDING DECEMBER 31, 1906.**Receipts and shipments.*

Class.	Quantity.	Value.
<b>Receipts:</b>	<b>Tons.</b>	
Coal.....	74,406	\$198,835
Lumber, laths.....	1,704	13,879
Ores, chemicals, etc.....	31,906	200,893
Corn, hay, etc.....	1,920	27,300
Sand, stone, clay, etc.....	48,896	61,262
Pipe and pig iron.....	23,287	491,761
Fertilizers, manure, etc.....	35,811	50,406
Miscellaneous.....	7,500	115,000
Total.....	224,410	1,153,726
<b>Shipments:</b>		
Chemicals.....	16,000	310,000
Fertilizers.....	1,607	93,186
Iron pipe.....	17,522	578,226
Miscellaneous.....	5,000	30,000
Total.....	40,129	1,011,412
Total receipts and shipments.....	264,539	2,165,412

The foregoing statistics were compiled from statements furnished by the Board of Trade of the city of Camden, N. J.

## I 3.

## IMPROVEMENT OF MANTUA CREEK, NEW JERSEY.

For the history of this improvement see the Annual Report of the Chief of Engineers for 1907, Part 1, page 188.

Under date of August 11, 1906, the Chief of Engineers approved the application of the available funds, as far as they would go, to the

construction of jetties to protect the channel at the new mouth, and on September 24 proposals were opened for the work, the lowest bidder being Richard Parrott, of Newburgh, N. Y., with whom contract dated October 6, 1906, was made at \$17.75 per linear foot for the jetties and \$5 per linear foot for the dike to close a gap in the bank made with the dredged material, the work to be begun within 30 days and completed within 90 working days after notification of approval of contract. The contract was approved October 15 and notification thereof given to the contractor October 19, 1906. Work on the contract was begun on November 8, but little progress was made in January, February, and the early part of March, due partly to stormy weather and the contractor's inability to secure delivery of the necessary materials. The time for the completion of the contract was waived for a reasonable period under authority of the Chief of Engineers dated February 1, 1907, and by authority of the Secretary of War a supplemental contract dated April 15, and approved April 17, 1907, was made for 325 additional feet more or less of dike to close the gap in the bank. At the close of the fiscal year 608 linear feet of the jetty had been constructed, of which 307 feet is on the east side of the entrance to the creek and 301 on the west side; also 186 feet of the dike. The portion of the jetty provided for by the contract has been completed and the dike, also, will be in the course of a few days.

Under date of March 19, 1907, the Chief of Engineers approved a project for the expenditure of the available funds in the completion of the jetties to the 12-foot curve in the Delaware River and the construction of a dike to close the old mouth of the creek; and to apply whatever balance may remain to redredging the channel to project dimensions from the Delaware River to Paulsboro. Proposals for the completion of the jetties and for the dike to close the old mouth were opened on June 21, 1907, and contract awarded to the lowest bidder, the Franklin K. Wills Company, of Wilmington, Del., on June 28, 1907, at \$19.90 per linear foot of jetty and \$9.25 per linear foot of dike, the work to be commenced within twenty days after notification of approval of contract, and completed within four months after such notification.

*Money statement.*

July 1, 1906, balance unexpended.....	\$15,564.54
Amount appropriated by river and harbor act approved March 2, 1907.....	34,450.00
	<hr/> 50,014.54
June 30, 1907, amount expended during fiscal year, for works of improvement.....	12,164.22
	<hr/> 37,850.32
July 1, 1907, balance unexpended.....	37,850.32
July 1, 1907, outstanding liabilities.....	2,400.00
	<hr/> 35,450.32
July 1, 1907, balance available.....	35,450.32
July 1, 1907, amount covered by uncompleted contracts.....	650.00
Amount (estimated) required for completion of existing project.....	50,580.00
	<hr/> <hr/>
{ Amount that can be profitably expended in fiscal year ending June 30, 1909, in addition to the balance unexpended July 1, 1907:	
For works of improvement.....	\$25,000.00
For maintenance of improvement.....	3,000.00
	<hr/> 28,000.00
{ Submitted in compliance with requirements of sundry civil act of June 4, 1897, and of section 7 of the river and harbor act of 1899.	



## APPROPRIATIONS.

August 2, 1882.....	\$3, 000
March 3, 1899.....	25, 000
June 13, 1902.....	35, 000
March 2, 1907.....	34, 450
Total.....	97, 450

## CONTRACTS IN FORCE.

With Richard Parrott, of Newburgh, N. Y., dated October 6, and approved October 15, 1906, for 600 feet of jetty and 75 feet of dike construction at mouth of Mantua Creek, New Jersey, at \$17.75 per foot for the jetty and \$5 per foot for the dike, the work to be commenced within thirty days after notification of approval of contract and completed within ninety working days after such notification. Time extended under authority of Chief of Engineers dated February 1, 1907.

Supplemental contract to above, dated April 15, 1907, approved by Chief of Engineers April 25, and by the Acting Secretary of War April 27, 1907, for 325 feet, more or less, additional dike at same price and upon same conditions, forty days being allowed therefor.

## COMMERCIAL STATISTICS FOR CALENDAR YEAR ENDING DECEMBER 31, 1906.

*Receipts and shipments.*

Class.	Quantity.	Value.
<b>Receipts:</b>	<i>Tons.</i>	
Raw bone, coal, phosphate rock, etc .....	160, 000	\$222, 500
Bricks, lumber, shingles, etc .....	4, 800	134, 000
Manure .....	20, 000	80, 000
Total .....	184, 800	386, 500
<b>Shipments:</b>		
Fertilizers, fruit, vegetables, potatoes, etc.....	55, 920	578, 200
Total receipts and shipments.....	240, 720	964, 700

*Vessels sailing and trading in Mantua Creek, New Jersey.*

Class.	Number.	Cargo.
Steamers.....	627	Rock.
Sailing vessels.....	63	Fish.
Barges.....	241	Grain.
Car floats.....	67	
Sloops.....	50	General truck.

NOTE.—The foregoing represents the number of times vessels of the classes given have entered the creek.

*Vessels built.*

Class.	Tonnage.	Draft.
Barges .....	24, 000	<i>Fect.</i> 10

# 1112 REPORT OF THE CHIEF OF ENGINEERS, U. S. ARMY.

## Vessels repaired.

Class.	Number.	Tonnage.
Steamers.....	2	40
Sailing vessels.....	2	100

One barge of 400 tons is under construction.

The foregoing statistics were furnished by W. J. Adamson, Paulsboro, N. J.

## I 4.

### IMPROVEMENT OF RACCOON CREEK, NEW JERSEY.

For the history of this improvement see the Annual Report of the Chief of Engineers for 1907, Part 1, page 189.

No work has been done on this improvement during the past fiscal year.

No contract in force.

### Money statement.

July 1, 1906, balance unexpended.....	\$10,400.78
Amount appropriated by river and harbor act approved March 2, 1907.....	15,000.00
	<u>25,400.78</u>
June 30, 1907, amount expended during fiscal year:	
For works of improvement.....	\$653.66
For maintenance of improvement.....	289.78
	<u>943.44</u>
July 1, 1907, balance unexpended.....	24,457.34
Amount (estimated) required for completion of existing project....	<u>57,135.00</u>
Amount that can be profitably expended in fiscal year ending June 30, 1909, in addition to the balance unexpended July 1, 1907:	
For works of improvement.....	\$10,000.00
For maintenance of improvement.....	2,500.00
	<u>12,500.00</u>
Submitted in compliance with requirements of sundry civil act of June 4, 1897, and of section 7 of the river and harbor act of 1899.	

### APPROPRIATIONS.

August 2, 1882.....	\$3,000
June 13, 1902.....	15,000
March 3, 1905.....	15,000
March 2, 1907.....	15,000
Total.....	<u>48,000</u>

## COMMERCIAL STATISTICS FOR CALENDAR YEAR ENDING DECEMBER 31, 1906.

*Receipts and shipments.*

Class.	Quantity.	Value.
<b>Receipts:</b>	<i>Tons.</i>	
Coal and dimension stone.....	7,400	\$77,000
Fertilizers and millwork.....	32,474	669,480
Grain, hay, potatoes.....	1,840	45,650
Miscellaneous.....	102,000	176,000
<b>Total.....</b>	<b>143,714</b>	<b>968,130</b>
<b>Shipments:</b>		
Berries, garden truck, and potatoes.....	41,450	1,000,000
Tomatoes.....	8,700	27,750
<b>Total.....</b>	<b>45,150</b>	<b>1,027,750</b>
<b>Total receipts and shipments.....</b>	<b>188,864</b>	<b>1,995,880</b>

*Vessels sailing and trading in Raccoon Creek, New Jersey.*

Class.	Number.	Aggregate tonnage.	Draft.	Remarks.
<b>Steamer.....</b>	<b>1</b>	<b>125</b>	<i>Fret.</i> 8	Daily.
Do.....	1	90	6	Do.
Do.....	1	50	5	Irregularly.
Barges.....	8		4 to 6	Do.
Naphtha launches.....	3		5	
Tugs.....	4		6	
<b>Total.....</b>	<b>18</b>	<b>265</b>		

The foregoing statistics were furnished by Lewis M. Shoch, Swedesboro, N. J.

## I 5.

## IMPROVEMENT OF SALEM RIVER, NEW JERSEY.

This is a new improvement and is provided for in the river and harbor act of March 2, 1907, as follows:

Improving Salem River, New Jersey: Completing improvement in accordance with the report submitted in House Document Numbered Seventy-eight, Fifty-fifth Congress, first session, twenty-nine thousand dollars.

The report referred to was submitted in June, 1897, and contemplates the formation of a channel 100 feet wide and 9 feet deep at mean low water, amplifying at the bends so as to permit the passage of a vessel 200 feet long from the Delaware River up to the highway bridge over Little Salem Creek, and the removal of the stony bars in front of the city wharves and at the bend above the brickyard, at an estimated cost of \$31,500.

Under date of March 19, 1907, a project was approved for the expenditure of the appropriation, including a survey of the stream before beginning the work of improvement. The field work of this survey has been completed.

No contract in force.

*Money statement.*

Amount appropriated by river and harbor act approved March 2, 1907.	\$29,000.00
June 30, 1907, amount expended during fiscal year, for works of improvement	318.79
July 1, 1907, balance unexpended	28,681.21
July 1, 1907, balance available	28,681.21
Amount that can be profitably expended in fiscal year ending June 30, 1909, for maintenance of improvement, in addition to the balance unexpended July 1, 1907.	5,000.00
Submitted in compliance with requirements of sundry civil act of June 4, 1897, and of section 7 of the river and harbor act of 1899.	

## APPROPRIATIONS.

Previous project:	
March 3, 1871	\$4,000
June 18, 1878	3,000
June 14, 1880	3,000
March 3, 1881	3,000
August 2, 1882	1,500
July 13, 1892	2,500
August 18, 1894	1,700
	\$18,700
Present project:	
March 2, 1907	29,000
Total	47,700

## I 6.

## IMPROVEMENT OF ALLOWAY CREEK, NEW JERSEY.

For the history of this improvement, see the Annual Report of the Chief of Engineers for 1907, Part 1, page 191.

No contract in force.

*Money statement.*

July 1, 1906, balance unexpended	\$509.24
Amount appropriated by river and harbor act approved March 2, 1907.	5,000.00
June 30, 1907, amount expended during fiscal year, for maintenance of improvement	5,509.24
July 1, 1907, balance unexpended	62.61
July 1, 1907, balance available	5,446.63
Amount (estimated) required for completion of existing project	200.00
Amount that can be profitably expended in fiscal year ending June 30, 1909, for maintenance of improvement, in addition to the balance unexpended July 1, 1907.	3,500.00
Submitted in compliance with requirements of sundry civil act of June 4, 1897, and of section 7 of the river and harbor act of 1899.	

\* Of this amount \$1,490.66 was carried to surplus fund.

## APPROPRIATIONS.

September 19, 1890.....	\$6,000	June 13, 1902.....	\$3,000
July 13, 1892.....	3,000	March 3, 1905.....	3,000
August 18, 1894.....	3,000	March 2, 1907.....	5,000
June 3, 1896.....	3,000		
March 3, 1899.....	3,000	Total .....	29,000

## COMMERCIAL STATISTICS FOR CALENDAR YEAR ENDING DECEMBER 31, 1906.

*Receipts and shipments.*

Class.	Quantity.	Value.
<b>Receipts:</b>	<i>Tons.</i>	
Coal, tin plates, sand, etc.....	29,800	\$238,500
Soda ash, flour, fertilizers, feed, etc.....	10,628	150,250
Miscellaneous.....	1,000	50,000
Total.....	40,928	438,750
<b>Shipments:</b>		
Canned goods, glassware, etc.....	10,775	605,000
Fruit, grain, hay, etc.....	6,200	124,000
Total.....	16,975	729,000
Total receipts and shipments.....	57,903	1,162,750

*Vessels sailing and trading in Alloway Creek, New Jersey.*

Class.	Number.	Aggregate tonnage.	Draft.	Remarks.
			<i>Feet.</i>	
Steamer.....	1	100	8	Triweekly.
Do .....	1	100	6	Semiweekly.
Do .....	1	100	6½	Occasionally.
Schooners.....	3	325	6 to 8	Do.
Barge.....	1	250	8	Monthly.
Gasoline boat.....	1	25	6	Weekly.
Tug .....	1	75	8	Occasionally.
Total.....	9	975		

The foregoing statistics were furnished by William Plummer, of the Quinton Glass Company, Quinton, N. J.

## I 7.

## IMPROVEMENT OF COHANSEY RIVER, NEW JERSEY.

Under date of March 19, 1907, the Chief of Engineers approved a project for the expenditure of the appropriation, the work to be done under two separate contracts, one for dredging the river from Stony Point to the head of navigation, and the other at the mouth. Proposals for the former were opened on June 24, 1907, and at the close of the fiscal year the award of the contract was under consideration. The work at the mouth is delayed pending the acquisition of land needed by the United States for a proposed cut-off. Negotiations for its transfer free of expense are now in progress and may soon be consummated.

The commerce of Cohansey River, which was very large for years prior to 1884, was only about 16,800 tons in 1906, as reported, owing to the deterioration of the channel.

No contract in force.

*Money statement.*

Amount appropriated by river and harbor act approved March 2, 1907	\$55,800. 00
June 30, 1907, amount expended during fiscal year, for works of improvement	31. 22
July 1, 1907, balance unexpended	55,768. 78
<hr/>	
{ Amount that can be profitably expended in fiscal year ending June 30, 1909, for maintenance of improvement, in addition to the balance unexpended July 1, 1907	3,500. 00
{ Submitted in compliance with requirements of sundry civil act of June 4, 1897, and of section 7 of the river and harbor act of 1899.	

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APPROPRIATIONS.

Previous project :	
March 3, 1873	\$10,000
June 18, 1878	5,000
March 3, 1879	4,500
June 14, 1880	4,500
March 3, 1881	7,000
August 2, 1882	5,000
	36,000
Present project :	
March 2, 1907	55,800
Total	91,800

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I 8.

## IMPROVEMENT OF TUCKERTON CREEK, NEW JERSEY.

For the history of this improvement see the Annual Report of the Chief of Engineers for 1907, Part 1, page 194.

No contract in force.

*Money statement.*

July 1, 1906, balance unexpended	\$248. 23
Amount appropriated by river and harbor act approved March 2, 1907	12,000. 00
	12,248. 23
June 30, 1907, amount expended during fiscal year, for maintenance of improvement	6. 00
July 1, 1907, balance unexpended	12,242. 23
Amount (estimated) required for completion of existing project	27,380. 00
<hr/>	
{ Amount that can be profitably expended in fiscal year ending June 30, 1909, in addition to the balance unexpended July 1, 1907:	
For works of improvement	\$20,000. 00
For maintenance of improvement	2,000. 00
	22,000. 00
{ Submitted in compliance with requirements of sundry civil act of June 4, 1897, and of section 7 of the river and harbor act of 1899.	

## APPROPRIATIONS.

June 13, 1902.....	\$12, 000
March 3, 1905.....	12, 000
March 2, 1907.....	12, 000
<b>Total</b> .....	<b>36, 000</b>

## COMMERCIAL STATISTICS FOR CALENDAR YEAR ENDING DECEMBER 31, 1906.

*Receipts and shipments.*

Class.	Quantity.	Value.
<b>Receipts:</b>	<i>Tons.</i>	
Oysters and fish.....	1, 850	\$710, 000
Fertilizers, scrap iron, salt, and hay.....	800	7, 000
<b>Total</b> .....	2, 650	717, 000
<b>Shipments:</b>		
Coal, cord wood, lumber, and agricultural products.....	580	200, 585
<b>Total receipts and shipments</b> .....	3, 230	917, 585

*Vessels sailing and trading in Tuckerton Creek, New Jersey.*

Class.	Number.	Aggregate tonnage.	Draft.	Remarks.
			<i>Fect.</i>	
Schooners.....	6	240	4	} In oyster and general merchandise trade. Days not regular.
Sloops.....	8	160	3	
Catboats.....	100	400	2½	
Garveys.....	420	840	2½	
Gunning and clam boats.....	150	300	1½	
Launches, gasoline.....	14	140	2½ to 3½	
<b>Total</b> .....	698	2, 080		

Vessels of a total of 3,000 tonnage repaired during the year.

One 15-ton power boat is under construction and one 10-ton sloop is being rebuilt.

The foregoing statistics were furnished by Benjamin H. Crosby, Tuckerton, N. J.

## I 9.

## IMPROVEMENT OF COLD SPRING INLET, NEW JERSEY.

This is a new project approved by the river and harbor act of March 2, 1907, which appropriated \$311,000 for a channel depth of 15 feet at mean low water, and provided for an increase of depth to 25 feet in case private interests should contribute \$100,000 to the improvement. The act further authorized contracts to be entered into to complete the improvement, to be paid for as appropriations may from time to time be made by law, not to exceed in the aggregate, exclusive of the amount therein appropriated and of any sums contributed from other sources, \$596,000 in case a 15-foot depth is made, or \$900,000 in case a 25-foot depth is made. For further conditions

and details see Annual Report of the Chief of Engineers for 1907, Part 1, page 195.

Arrangements have been in progress since the passage of the act for the execution of the required deeds, etc., to the United States of the land and easements required before work can be undertaken by the Government, and the Cape May Real Estate Company, of Cape May, N. J., has agreed to convey the necessary land and to execute a bond for the contribution of the \$100,000 required in order to make the depth of channel 25 feet.

As soon as all these formalities have been duly approved it is proposed to begin work under a project approved by the Chief of Engineers under date of May 13, 1907, for the expenditure of \$1,311,000. This contemplates the construction of jetties at the entrance, and the submission later, during the progress of the jetty work, of an application for dredging to a depth of 25 feet at mean low water.

No contracts in force.

#### *Money statement.*

Amount appropriated by river and harbor act approved March 2, 1907-----	\$311,000.00
Amount (estimated) required for completion of existing project----	900,000.00
<hr/>	
{ Amount that can be profitably expended in fiscal year ending June 30, 1909, for works of improvement, in addition to the balance unexpended July 1, 1907-----	900,000.00
Submitted in compliance with requirements of sundry civil act of June 4, 1897.	

#### APPROPRIATION.

Act approved March 2, 1907-----	\$311,000
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#### I 10.

#### IMPROVEMENT OF WILMINGTON HARBOR, DELAWARE.

For the history of this improvement, see Annual Report of the Chief of Engineers for 1907, Part 1, page 196.

At the close of the fiscal year 1906 dredging was in progress under a contract made with the Bowers Hydraulic Dredging Company, dated July 7, 1905, at 11 cents per cubic yard, place measurement. July 28, 1906, a supplemental contract was entered into and approved by the Chief of Engineers August 16, and by the Secretary of War August 17, 1906, providing for additional dredging at the same price, and work was carried on thereunder until October 16, 1906. The channel was dredged to a depth of 18 feet at mean low water, the widths made being 250 feet to the mouth of the Brandywine and thence to the Third Street Bridge 200 feet wide. The quantity of material removed under these two contracts was 376,694 cubic yards and consisted of sand, mud, and gravel, which was pumped ashore behind banks above the high-water line. The result of these opera-



tions was a minimum depth of 18 feet at mean low water from the 18-foot curve in the Delaware River to the Third Street Bridge. This was as far as the dredging could be done by the Federal Government under the terms of the appropriation which was for work "up to the Third Street Bridge."

To provide for the necessities of navigation above Third Street Bridge the city of Wilmington appropriated \$4,857 in accordance with an act of the State legislature approved March 9, 1901. By authority of the Secretary of War and upon request of the city authorities, the supervision of the work and expenditure of the appropriation was assumed on behalf of the city by the local United States engineer officer. After due advertisement, contract dated September 26, 1906, was entered into with the River and Harbor Improvement Company of New Jersey, the only bidder, at 27 cents per cubic yard, place measurement. Work thereon was begun on October 19 and completed November 3, 1906, during which period the channel was dredged to a depth of 17 feet at mean low water and a width of 75 feet from a point about 1,100 feet above the Third Street Bridge to a point about 100 feet below the Market Street Bridge, a distance of 2,600 feet. The quantity of material removed was 16,004 cubic yards, measured in place. This consisted of sand, mud, and gravel and was conveyed in scows to the American Dredging Company's dredge *Pennsylvania*, lying on the Delaware River front of the city, where it was pumped ashore upon the meadows of the Cherry Island Marsh Company. The result of these operations by the city was a continuous channel 75 feet wide and 17 feet deep at mean low water from the Third Street Bridge to the Market Street Bridge, and connecting with the channel above and below the bridges dredged by the United States Government. The cost of this, including advertising (\$18.50 of which was paid by the city treasurer) and inspection, was \$4,400.54. The amount expended by the United States engineer officer on this account from the amount turned over to him (\$4,857), was \$4,382.04. The balance, \$474.96, was returned to the city by check, dated November 28, 1906.

Under date of March 19, 1907, the Chief of Engineers approved a project which provides for repairs to the jetties at the mouths of the Christiana and Brandywine and for dredging and maintaining the channel 18 feet deep at mean low water from that depth in the Delaware River to the Baltimore and Ohio Railroad bridge, with a bottom width of 250 feet to the mouth of the Brandywine and thence 200 feet to the Baltimore and Ohio Railroad bridge.

After due advertisement, proposals for dredging were opened on May 8, and contract dated May 17 and approved June 6, 1907, made with the lowest bidder, the Bowers Hydraulic Dredging Company, of Camden, N. J., at 15.9 cents per cubic yard, place measurement. The work is to be completed within twelve months after notification of approval of contract, which was given June 10, 1907. Work on the retaining banks to hold the material to be dredged on this contract has been begun, and it is expected that the dredging will be commenced early in July.

*Money statement.*

July 1, 1906, balance unexpended.....	\$33,580.42
Amount appropriated by river and harbor act approved March 2, 1907.....	75,000.00
Allotted from emergency appropriation, river and harbor act approved March 3, 1905.....	250.00
	<hr/> 108,810.42
June 30, 1907, amount expended during fiscal year:	
For maintenance of improvement.....	\$24,816.14
Returned to Treasury.....	62.97
	<hr/> 24,879.11
July 1, 1907, balance unexpended.....	83,931.31
July 1, 1907, outstanding liabilities.....	8,600.00
	<hr/> 75,331.31
July 1, 1907, balance available.....	<hr/> 75,331.31
July 1, 1907, amount covered by uncompleted contracts.....	<hr/> 55,000.00
Amount that can be profitably expended in fiscal year ending June 30, 1909, in addition to the balance unexpended July 1, 1907:	
For dredge.....	\$175,000.00
For dredging.....	* 135,000.00
	<hr/> 310,000.00
Submitted in compliance with requirements of sundry civil act of June 4, 1897, and of section 7 of the river and harbor act of 1899.	

## APPROPRIATIONS.

July 14, 1836.....	\$15,000	September 19, 1890.....	\$30,000
March 3, 1837.....	8,000	July 13, 1892.....	40,000
July 7, 1838.....	9,356	August 18, 1894.....	25,000
July 11, 1870.....	15,000	June 3, 1896.....	20,000
June 10, 1872.....	10,000	July 1, 1898.....	205,846
March 3, 1873.....	6,000	March 3, 1899.....	45,000
June 23, 1874.....	6,000	June 6, 1900.....	200,000
March 3, 1875.....	10,000	June 13, 1902.....	50,000
August 14, 1876.....	16,000	March 3, 1905.....	25,000
June 18, 1878.....	7,000	March 3, 1905 (allotment)...	250
March 3, 1879.....	3,500	March 2, 1907.....	75,000
June 14, 1880.....	10,000		
March 3, 1881.....	50,000	Total.....	1,005,702
August 2, 1882.....	50,000	Received from sale of river	
July 5, 1884.....	25,000	and harbor property.....	210
August 5, 1886.....	18,750		
August 11, 1888.....	30,000	Total.....	1,005,912
Amount returned to the Treasury.....			<hr/> \$2,474.19

## CONTRACTS IN FORCE.

With the Bowers Hydraulic Dredging Company, of Camden, N. J., for dredging between the Delaware River and the Third Street Bridge, at 11 cents per cubic yard, place measurement, the work to be commenced within forty-five days from July 7, 1905, and completed within eleven months from that date. Contract dated July 7 and approved July 24, 1905.

With the Bowers Hydraulic Dredging Company, of Camden, N. J., supplementary to the above contract, dated July 28, 1906, for additional dredging within the same limits and at the same price, the work to be commenced on or

\* \$5,000 between Newport and the pulp works.

before July 30 and completed by November 1, 1906. Contract dated July 28 and approved August 18 by the Chief of Engineers and August 17, 1906, by the Acting Secretary of War.

Emergency contract dated December 22, 1906, made with A. S. Truitt, of New Castle, Del., for removal of snag or log from channel of Christiana River, the work to be completed within ten days from date of contract. Price, \$80.

With the Bowers Hydraulic Dredging Company, of Camden, N. J., for dredging between the Baltimore and Ohio Railroad bridge and the Delaware River, at 15.9 cents per cubic yard, place measurement, the work upon the retaining basins to be commenced within twenty days after notification of approval of contract and the entire work completed within twelve months after such notification of approval. Notification given June 10, 1907. Contract dated May 17 and approved June 6, 1907.

### COMMERCIAL STATISTICS.

The tonnage and value of the leading articles shipped to and from the port of Wilmington, by water, during the calendar year ending December 31, 1906, are as follows:

*Commercial statistics of the city of Wilmington, Del., for the calendar year 1906.*

Articles.	Quantity.	Value.
<b>DOMESTIC COMMERCE.<sup>a</sup></b>		
<b>Receipts:</b>	<i>Tons.</i>	
Hides, railroad ties, ship timber, etc.....	513, 126	\$14, 290, 264
Chemicals, oils, wood pulp, building material, etc.....	47, 031	1, 917, 165
Agricultural products, cattle, horses, hogs, etc.....	14, 850	2, 318, 555
General merchandise, including dry goods, groceries, etc.....	30, 000	6, 000, 000
Miscellaneous not included above.....	50, 000	10, 000, 000
<b>Total receipts.....</b>	<b>754, 507</b>	<b>34, 525, 974</b>
<b>Shipments:</b>		
Coal, quarry stone, etc.....	147, 969	433, 025
Manufactured products, canned goods, flour, iron supplies, leather, etc.....	25, 758	14, 834, 860
Agricultural products.....	760	142, 000
General merchandise, including dry goods, groceries, etc.....	20, 775	4, 194, 590
Miscellaneous, not included above.....	50, 000	10, 000, 000
<b>Total shipments.....</b>	<b>245, 262</b>	<b>29, 604, 475</b>
<b>Total receipts and shipments, domestic.....</b>	<b>999, 769</b>	<b>64, 130, 449</b>
<b>FOREIGN COMMERCE.<sup>b</sup></b>		
<b>Imports:</b>		
China clay.....	700	3, 880
Cornwall rock.....	6, 061	2, 460
Nitrate of soda.....	5, 815	245, 568
Bowlder flints.....	300	474
Crede China stone.....	1, 209	5, 083
Scrap iron and steel.....	400	4, 000
Laths.....	1, 845	4, 594
<b>Total imports.....</b>	<b>16, 880</b>	<b>266, 009</b>
<b>Exports:</b>		
Car material.....	250	93, 109
Spruce timber.....	150	4, 365
Powder.....	197	17, 675
<b>Total exports.....</b>	<b>597</b>	<b>115, 149</b>
<b>Total imports and exports, foreign.....</b>	<b>16, 927</b>	<b>881, 168</b>
<b>Total receipts and shipments, domestic and foreign.....</b>	<b>1, 016, 696</b>	<b>64, 511, 617</b>

<sup>a</sup> Furnished by the Wilmington Board of Trade.

<sup>b</sup> Furnished by the United States collector of customs, Wilmington, Del.

*Vessels sailing and trading in Wilmington Harbor.*

[Furnished by the Wilmington Board of Trade.]

Class.	Name.	Registered tonnage each.	Draft.	Trips.
			<i>Feet.</i>	
Barges.....	Various.....	100	8	1 per day.
Schooners.....	do.....	50	6	Do.
Do.....	do.....	250	19	1 per month.
Naphtha launches or barges.....	do.....	12	3	15 per day, 9 months in year.
10 harbor tugs.....	do.....	12-25	5-10	10 daily.
10 barges.....	do.....	475	8	1 weekly.
1 barge.....	do.....	100	4	Do.
1 schooner.....	Sandmipe.....	65	6	2 per week.
1 barge.....	Seven.....	150	7 1/2	2 daily, each way.
Do.....	Nine.....	150	7 1/2	Do.
Do.....	Alice.....	150	7 1/2	Do.
Do.....	Century.....	150	7 1/2	Do.
Do.....	Christiana.....	200	8	Do.
1 steamer.....	Ulrica.....	205	7	Daily.
Do.....	Brandywine.....	407	10	Do.
Do.....	City of Chester.....	504	10	Do.
8 barges.....	Various.....	150	6	Do.
4 car floats.....	do.....	250	6	Do.
River tugs and steamers.....	do.....	50-100	7	2 daily.
Sand barges.....	do.....	300	8	1 daily.
Yachts.....	do.....	25-150	6-10	3 weekly, 9 months in year.
Dredge.....	Phoenix.....	250	10	1 per month.
Steamer.....	Dorothy.....	505	12	2 or 3 per week.
Barges.....	Various.....	100-500	6-12	2 per month.

Foreign vessels sailing and trading in Wilmington Harbor, Delaware, during the calendar year 1906, furnished by United States collector of customs, port of Wilmington, Del.: Fifteen vessels, aggregate tonnage 22,028, and draft an average of about 18 feet.

In addition to the foregoing, there is invested in freight and passenger lines, domestic, doing business in the harbor of Wilmington, approximately \$1,350,000. These lines carry freight valued at approximately \$50,000,000 annually, and about 600,000 passengers.

A direct line of steamers between New York and Wilmington, making two to three round trips a week, has been established and been in operation during the past year.

There is invested in manufacturing and mercantile interests on the Christiana River, all dependent upon the river's navigation facilities, fully \$25,000,000. This is exclusive of the investments on the Brandywine, tributary to the Christiana, and which would amount to not less than \$500,000.

*Vessels built.*

Class.	Wood.	Steel.	Tonnage.	Draft.
				<i>Feet.</i>
Ferryboats.....		4	4,805	
Tugboats.....		8	720	
Steam barge.....	1		830	8
Steamer, freight and passenger.....	1		288	6
Revenue cutter.....	1		1,200	
Yacht.....		1	198	9
Oil barge.....		1	160	
Car floats.....	9		6,740	
Do.....		3	2,790	
Dump scows.....	6		6,200	
Total.....	18	12	23,426	

*Vessels repaired.*

Class.	Number.	Tonnage.
Coal barges .....	8	7,200
Dump scows .....	4	4,200
Vessels (about) .....	1,000	123,000
Barges .....	16	3,350
Steamers .....	23	20,380
Sailing vessels .....	21	10,490
Total .....	1,072	168,620

*Vessels under construction.*

One steel revenue cutter, 158 feet by 30 feet by 10 feet, 408 tons displacement, draft 5 feet.

Three steel towing boats, each 86 feet by 20 feet by 10 feet 10 inches, draft 7 feet 6 inches.

One composite lighter.

One steel light-house tender.

Four steel tugboats.

One steel wrecking steamer.

Two steel coastwise steamers.

Three steel ferryboats.

Two steel lumber steamers.

Three steel car floats.

## I II.

## IMPROVEMENT OF APPOQUINIMINK, MURDERKILL, AND MISPELLION RIVERS, DELAWARE.

## (A) APPOQUINIMINK RIVER.

For the history of this improvement, see the Annual Report of the Chief of Engineers for 1907, Part 1, page 198.

No work has been done on this improvement during the past fiscal year. The expenditures were for examinations and arrangements for dredging this year.

Proposals were opened on May 4, 1907, and contract made with the lowest bidder, The Rickards Dredging Company, of Philadelphia, Pa., for this and other works, at 14½ cents per cubic yard, place measurement, for the Appoquinimink River dredging, the entire work provided for by the contract to be completed by November 11, 1907.

*Money statement.*

July 1, 1906, balance unexpended.....	\$1,496.16
Amount allotted from appropriation made by river and harbor act approved March 2, 1907.....	5,000.00
Transferred from Mississippi River allotment.....	100.00
	<hr/> 6,596.16

June 30, 1907, amount expended during fiscal year:	
For works of improvement.....	\$150.00
For maintenance of improvement.....	396.36
	<hr/> 546.36

July 1, 1907, balance unexpended.....	<hr/> 6,049.80
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July 1, 1907, amount covered by uncompleted contracts.....	4,200.00
Amount (estimated) required for completion of existing project.....	7,400.00
	<hr/> <hr/>

Amount that can be profitably expended in fiscal year ending June 30, 1909, in addition to the balance unexpended July 1, 1907:	
For works of improvement.....	\$7,400.00
For maintenance of improvement.....	2,500.00
	<hr/> 9,900.00
Submitted in compliance with requirements of sundry civil act of June 4, 1897, and of section 7 of the river and harbor act of 1899.	

## APPROPRIATIONS.

September 19, 1890.....	\$5,000	June 13, 1902 (allotments)....	\$7,000
July 13, 1892.....	5,000	March 3, 1905 (allotments)....	5,600
August 18, 1894.....	5,000	March 2, 1907 (allotment)....	5,000
June 3, 1896.....	5,000		
March 3, 1899.....	5,000	Total .....	42,600
Returned to Treasury.....			<hr/> \$3.00

## CONTRACT IN FORCE.

With The Rickards Dredging Company, of Philadelphia, Pa., for dredging Appoquinimink, Smyrna, St. Jones, and Murderkill rivers, Delaware, the work to be begun June 16 and to be completed by November 11, 1907. Contract dated May 14 and approved May 22, 1907. Price for Appoquinimink River, 14½ cents per cubic yard, place measurement.

## COMMERCIAL STATISTICS FOR CALENDAR YEAR ENDING DECEMBER 31, 1906.

*Receipts and shipments.*

Class.	Quantity.	Value.
<b>Receipts:</b>	<i>Tons.</i>	
Coal.....	2,200	\$13,200
Fertilizers.....	5,725	80,150
Potatoes.....	295	11,800
General merchandise.....	7,800	780,000
Total.....	16,020	885,150
<b>Shipments:</b>		
Canned goods.....	2,325	282,500
Agricultural products—butter, eggs, fruit, grain, poultry, etc.....	12,745	926,875
Fish.....	295	47,200
General merchandise.....	985	88,650
Total.....	16,350	1,296,225
Total receipts and shipments.....	32,370	2,180,375

*Vessels trading in Appoquinimink River, Delaware.*

Class.	Number.	Aggregate tonnage.	Draft.	Remarks.
Steamer.....	1	196	7	Semiweekly.
Do.....	1	210	7	Transient.
Tugs.....	2	.....	7	Do.
Schooners.....	2	150	6	Do.
Barges.....	2	400	6½	Do.
Gasoline barges.....	2	250	6½	Do.
Total.....	10	1,146		

The above statistics were furnished by F. B. Watkins, Odessa, Del.

## (B) MURDERKILL RIVER.

The previous history of the improvement is contained in the Annual Report of the Chief of Engineers for 1907, Part 1, page 199.

No work has been done on the improvement during the past fiscal year.

Proposals for work with available funds were opened May 4, 1907, and contract dated May 14 and approved May 22, 1907, made with The Rickards Dredging Company, of Philadelphia, Pa., the lowest bidder, at 14 cents per cubic yard, place measurement, the work, in conjunction with other dredging, to be completed by November 11, 1907.

*Money statement.*

July 1, 1906, balance unexpended.....	\$565. 47
Amount allotted from appropriation made by river and harbor act approved March 2, 1907.....	8, 000. 00
	8, 565. 47
June 30, 1907, amount expended during fiscal year:	
For maintenance of improvement.....	\$448. 37
Redeposited to credit appropriation emergency.....	279. 19
	727. 56
July 1, 1907, balance unexpended.....	7, 837. 91
July 1, 1907, amount covered by uncompleted contracts.....	7, 200. 00
Amount (estimated) required for completion of existing project....	23, 264. 00
Amount that can be profitably expended in fiscal year ending June 30, 1909, in addition to the balance unexpended July 1, 1907:	
For works of improvement.....	\$10, 000. 00
For maintenance of improvement.....	2, 500. 00
	12, 500.00
Submitted in compliance with requirements of sundry civil act of June 4, 1897, and of section 7 of the river and harbor act of 1899.	

## APPROPRIATIONS.

July 13, 1892.....	\$7,000	March 3, 1905 (allotment)---	\$5,500
August 18, 1894.....	“6,500	March 3, 1905 (allotment)---	3,880
June 3, 1896.....	6,500	March 2, 1907 (allotment)---	8,000
March 3, 1899.....	5,000		
June 13, 1902 (allotment)---	2,000	Total .....	“49,880
April 28, 1904 (allotment)---	5,500		
Expended for mouth of St. Jones River.....			\$1,500. 00
Returned to Treasury.....			347. 52
Total .....			1,847. 52

## CONTRACT IN FORCE.

With the Rickards Dredging Company, of Philadelphia, Pa., dated May 14, and approved May 22, 1907, for dredging the Murderkill and other rivers in Delaware, the work to be commenced twenty days after notification of approval, which was May 27, 1907, and to be completed within five and one-half months. Price for Murderkill River, 14 cents per cubic yard place measurement. Amount, \$7,200.

## COMMERCIAL STATISTICS FOR CALENDAR YEAR ENDING DECEMBER 31, 1906.

*Receipts and shipments.*

Class.	Quantity.	Value.
<b>Receipts:</b>	<i>Tons.</i>	
Coal, tin, solder, oysters, etc.....	5,905	\$82,500
Fertilizers, lumber, etc.....	6,400	158,000
Hay, horses, cattle, etc.....	408	36,125
General merchandise.....	1,300	260,000
Total.....	14,011	536,625
<b>Shipments:</b>		
Canned goods, baskets, machinery, etc.....	3,300	245,000
Agricultural products—fruit, eggs, poultry, corn, wheat, etc.....	11,004	496,900
General merchandise.....	700	140,000
Total .....	15,004	881,900
Total receipts and shipments.....	29,015	1,418,525

*Vessels sailing and trading in Murderkill River, Delaware.*

There is a steamer trading in the Murderkill River with a tonnage of 293 and a draft of 6 feet. It makes two or three trips a week. Also from thirty to forty small sailing vessels and steam and naphtha launches with an average tonnage of 30 and about 5 feet draft:

Ten naphtha steamers and 30 sailing vessels, 1,050 tons, repaired during the year.

The foregoing statistics were furnished by J. W. Townsend, secretary Frederica and Philadelphia Steamboat Company, Frederica, Del.

“Of this amount, \$1,500 was expended in removing shoal at mouth of St. Jones River.



## (C) MISPELLION RIVER.

For the history of this improvement, see the Annual Report of the Chief of Engineers for 1907, Part 1, page 201.

At the beginning of the present fiscal year operations were in progress under a contract for dredging at the mouth and in the river, and proposals had been invited for the extension of the Green Point jetty, to be opened July 19, 1906.

The dredging was continued to August 20, 1906. The channel across the flats at the mouth of the river was dredged to the 5-foot curve in Delaware Bay, a length of 4,360 feet, the cut being made 50 feet wide and  $5\frac{1}{2}$  feet deep at mean low water from the outer end of the north jetty. The quantity of material removed was 22,368 cubic yards, place measurement, and consisted of sand, mud, and oyster shells, and was deposited along the south side of the dredged cut.

In the river dredging was begun on July 24 at New Wharf reach and continued upstream to the steamboat wharf at Milford, a distance of about 5 miles. Eight shoals were dredged to a depth of  $4\frac{1}{2}$  feet at mean low water and a width of 40 feet, and at sharp turns the channel was widened. The quantity of material removed in this section was 22,456 cubic yards, measured in place, and consisted mainly of mud. It was deposited upon the adjacent marshes. The contract price was 9.9 cents per cubic yard, place measurement.

Proposals for the extension of the Green Point jetty were opened July 19 and emergency contract dated July 20, 1906, made with the Tatnall-Brown Company, of Wilmington, Del., the lowest bidder, at \$7.50 per linear foot. Work under this contract was begun on September 1, 1906. On October 16 the time limit for completion was waived for a reasonable period, the contractor to pay expenses for supervision and inspection during the extended period. The contract work was completed on November 16, 1906. The entire length of the extension made is 511.2 feet, running in a southeasterly direction, parallel to the north jetty.

Under date of March 20, 1907, the Secretary of War approved an allotment of \$40,000, the same to be expended in accordance with the report referred to in the appropriation made by the act of March 2, 1907, and under date of March 22, 1907, the Chief of Engineers approved a project for such jetty work and dredging as can be done with allotment. Proposals for jetty construction and repairs were opened May 20, 1907, and contract dated June 4 and approved June 18, 1907, made with the lowest bidder, the Tatnall-Brown Company, of Wilmington, Del., at \$10.35 per linear foot, for the construction of the jetty, the work to be completed within five months after notification of approval of the contract. Work under this contract began on June 15, and to the end of the fiscal year 160 piles had been driven, 170 linear feet of waling placed, and 84 feet of repairs to the north jetty completed.

*Money statement.*

July 1, 1906, balance unexpended.....	\$10, 170. 72
Amount appropriated by river and harbor act approved March 2, 1907.....	40, 000. 00
	<hr/> 50, 170. 72
Transferred to Appoquinimink River improvement.....	100. 00
	<hr/> 50, 070. 72
June 30, 1907, amount expended during fiscal year:	
For works of improvement.....	\$426. 56
For maintenance of improvement.....	10, 070. 72
	<hr/> 10, 497. 28
July 1, 1907, balance unexpended.....	39, 573. 44
July 1, 1907, outstanding liabilities.....	150. 00
	<hr/> 39, 423. 44
July 1, 1907, balance available.....	39, 423. 44
July 1, 1907, amount covered by uncompleted contracts.....	24, 850. 00
Amount (estimated) required for completion of existing project.....	47, 065. 00
	<hr/> <hr/>
Amount that can be profitably expended in fiscal year ending June 30, 1909, in addition to the balance unexpended July 1, 1907:	
For works of improvement.....	\$25, 000. 00
For maintenance of improvement.....	2, 800. 00
	<hr/> 27, 800. 00
Submitted in compliance with requirements of sundry civil act of June 4, 1897, and of section 7 of the river and harbor act of 1899.	

## APPROPRIATIONS.

Previous projects:		Previous projects—Continued:	
March 3, 1879.....	\$3, 000	June 13, 1902 (allotments)	\$15, 300
June 14, 1880.....	4, 000	April 28, 1904 (allotment)	1, 800
March 3, 1881.....	3, 500	March 3, 1905 (allotments)	19, 000
August 2, 1882.....	3, 000		<hr/> 78, 650
August 11, 1888.....	3, 500	Present project:	
July 13, 1892.....	12, 000	March 2, 1907 (allotment)	40, 000
August 18, 1894.....	10, 000		<hr/> 118, 650
March 3, 1899.....	2, 500	Total.....	
June 6, 1900 (allotment).....	1, 050		
Returned to the Treasury.....			\$159. 93
Transferred to Appoquinimink River, Delaware, improvement.....			100. 00

## CONTRACTS IN FORCE.

With the Pennsylvania Dredging Company, of Camden, N. J., approved May 26, 1906, for dredging 45,400 cubic yards of material, at 9.9 cents per cubic yard, place measurement, the work to be commenced within thirty days after notification of approval of contract and completed within three months after such notification.

Emergency contract, dated July 20, 1906, with Tatnall-Brown Company, of Wilmington, Del., for extension of jetty at mouth of Mispillion River, Delaware, 500 linear feet, at \$7.50 per linear foot, the work to be commenced within thirty days and completed within three months from date of contract.

Contract of the Tatnall-Brown Company, of Wilmington, Del., approved June 18, 1907, work to be commenced within twenty days and completed within five months after notification of approval of contract, for jetty construction and repairs at mouth of Mispillion River, Delaware, at the following prices, viz:

Jetty construction, at \$10.35 per linear foot.

Materials for repairs in place: Lumber, including spikes, etc., \$60 per M feet B. M.; stone, \$4 per cubic yard; brush, \$5 per cord.

Estimated cost of jetty construction and repairs, \$25,000.

## COMMERCIAL STATISTICS FOR CALENDAR YEAR ENDING DECEMBER 31, 1906.

*Receipts and shipments.*

Class.	Quantity.	Value.
<b>Receipts:</b>	<i>Tons.</i>	
Coal, stone, raw bone, sand, ship timber, etc.....	25,971	\$237,978
Fertilizers, flour, canned goods, etc.....	26,347	671,030
Hay, hogs, horses, etc.....	4,380	192,600
General merchandise.....	25,000	2,122,000
<b>Total.....</b>	<b>81,698</b>	<b>3,223,608</b>
<b>Shipments:</b>		
Cord wood, logs, railroad ties, etc.....	107,250	872,000
Canned goods, lumber, etc.....	27,130	1,188,700
Agricultural products—fruits, grain, poultry, etc.....	42,626	1,388,020
<b>Total.....</b>	<b>177,006</b>	<b>2,898,720</b>
<b>Total receipts and shipments.....</b>	<b>258,704</b>	<b>6,117,323</b>

*Vessels trading in Mispillion River, Delaware.*

Class.	Number.	Aggregate tonnage.	Draft.	Remarks.
<b>Steamer.....</b>	<b>1</b>	<b>132</b>	<i>Feet.</i> 6½	Triweekly.
Do.....	1	140	6	Do.
Do.....	1	300	4½	Occasionally.
<b>Sailing vessels.....</b>	<b>9</b>	<b>920</b>	4½ to 5	Weekly.
<b>Total.....</b>	<b>12</b>	<b>1,492</b>		

One steamer, draft 6½ feet and 130 tonnage; one tug, 5½ feet draft; five barges of an aggregate of 2,850 tons; one barge of 300 tons, and one police boat, draft 4 feet, built during the year.

Three vessels are under construction, as follows:

One freight and passenger steamer, 100' by 29' by 8' 6".

One freight and passenger steamer, 100' by 23' by 7'.

One freight and passenger steamer, 100' by 22' 8" by 7'.

One additional steamer, 300 tons, to be put in service during the coming year.

The foregoing statistics were furnished by J. Stanley Short, of Milford, Del.

## I 12.

## IMPROVEMENT OF ST. JONES RIVER, DELAWARE.

For previous history of this improvement see the Annual Report of the Chief of Engineers for 1907, Part 1, page 203.

At the close of the fiscal year 1906 operations were in progress under a contract for dredging with the \$9,500 allotted by the Secretary of War on March 9, 1906, and the channel had been dredged from Lebanon downstream a distance of about 4½ miles and across the flats at the mouth for a length of 2,900 feet. This work was continued to September 4, 1906, when the contract was completed. The dredging done included 23 shoals in the river, an aggregate length of 25,061 feet, resulting in a continuous channel from Lebanon to the 6-foot curve in Delaware Bay, with a width not less than 40 feet in the river and 50 feet across the flats, the depth being not less than 6

feet at mean low water. The price paid for this work was 8½ cents per cubic yard, place measurement. The quantity of material removed was 83,504 cubic yards, measured in place, and consisted of sand, gravel, clay, and mud, with numerous stumps and logs. That taken from the river was placed ashore above the high-water line and that removed from the flats was thrown over along the south side of the cut.

On May 4, 1907, proposals were opened for dredging this and other streams in Delaware emptying into Delaware Bay, the Rickards Dredging Company, of Philadelphia, Pa., being the lowest bidder, at 16 cents per cubic yard, place measurement. Contract was entered into May 14 and approved May 22, 1907, and work under this contract was begun on June 25 and continued to the end of the fiscal year, when it was still in progress. The channel was dredged downstream a length of 250 feet from Wilson's wharf, about 1½ miles below the steamboat wharf at Lebanon, and a length of 900 feet was dredged from the mouth across the flats, width and depth made being, respectively, 50 and 6 feet at mean low water. The quantity of material removed is 2,130 cubic yards, measured in place, and consisted of mud and sand. That dredged in the river was thrown over upon the adjacent banks and that dredged from the flats was deposited along the south side of the dredged cut.

#### *Money statement.*

July 1, 1906, balance unexpended.....	\$8, 583. 47
Amount appropriated by river and harbor act approved March 2, 1907..	3, 000. 00
	11, 583. 47
June 30, 1907, amount expended during fiscal year:	
For maintenance of improvement.....	\$7, 800. 22
Returned to Treasury.....	1, 035. 24
	8, 835. 46
July 1, 1907, balance unexpended.....	2, 748. 01
July 1, 1907, outstanding liabilities.....	320. 00
	2, 428. 01
July 1, 1907, balance available.....	2, 428. 01
July 1, 1907, amount covered by uncompleted contracts.....	2, 300. 00
	2, 300. 00
{ Amount that can be profitably expended in fiscal year ending June 30, 1909, for maintenance of improvement, in addition to the balance unexpended July 1, 1907.....	3, 300. 00
{ Submitted in compliance with requirements of sundry civil act of June 4, 1897, and of section 7 of the river and harbor act of 1899.	

#### APPROPRIATIONS.

March 3, 1881.....	\$5, 000	June 13, 1902 (allotment).....	\$4, 500
July 5, 1884.....	10, 000	March 3, 1905 (allotment).....	9, 650
August 5, 1886.....	10, 000	March 2, 1907.....	3, 000
August 11, 1888.....	15, 000		
August 18, 1894.....	1, 500	Total .....	62, 150
June 6, 1900 (allotment).....	3, 500		
Returned to the Treasury.....			\$1, 593. 50

## CONTRACTS IN FORCE.

Contract of the Houston-Rickards Dredging Company, of Philadelphia, Pa., dated April 20, and approved May 2, 1906, for dredging, at 8½ cents per cubic yard, place measurement. Amount available, \$8,500. Work began May 22 and was completed August 31, 1906.

Contract of The Rickards Dredging Company, of Philadelphia, Pa., dated May 14, and approved May 22, 1907, for dredging at 16 cents per cubic yard, place measurement, the work for this river in conjunction with other rivers in Delaware to be completed within five and one-half months. Dredging on the St. Jones River began June 25, 1907.

## COMMERCIAL STATISTICS FOR CALENDAR YEAR ENDING DECEMBER 31, 1906.

*Receipts and shipments.*

Class.	Quantity.	Value.
<b>Receipts:</b>	<i>Tons.</i>	
Raw bone, tin plate, phosphate rock, etc.....	11, 212	\$672, 840
Chemicals, canned goods, flour, iron supplies, etc.....	9, 891	622, 512
Agricultural products.....	2, 139	231, 426
General merchandise.....	10, 250	2, 152, 500
Total.....	33, 492	3, 578, 778
<b>Shipments:</b>		
Cord wood, railroad ties, ship timber, oysters, etc.....	2, 974	103, 837
Canned goods, fertilizers, baskets, etc.....	12, 204	676, 260
Peaches, pears, apples, grain, cattle, etc.....	3, 836	1, 437, 815
General merchandise.....	2, 690	470, 750
Total.....	21, 704	2, 587, 162
Total receipts and shipments.....	55, 196	6, 165, 940

*Vessels sailing and trading in Saint Jones River, Delaware.*

Class.	Number.	Aggregate tonnage.	Draft.	Remarks.
Steamer.....	1	220	<i>Feet.</i> 6	4 to 6 times a week.
Steamers.....	11	1, 100	3½ to 6½	Occasionally.
Tugs.....	2		5 to 6	Do.
Schooners, sloops, etc.....	65	3, 427	2 to 6	Occasionally, and several regularly.
Total.....	79	4, 747		

The foregoing statistics were furnished by the Lebanon Navigation Company, Lebanon, Delaware.

## I 13.

## IMPROVEMENT OF SMYRNA RIVER, DELAWARE.

For previous history see Annual Report of the Chief of Engineers for 1907, Part 1, page 205.

The river and harbor act of March 2, 1907, appropriated \$2,000 for maintenance of this improvement, and under date of March 19, 1907, the Chief of Engineers approved a project for its expenditure, together with an unexpended balance of \$400 from former allotments in removing shoals that had formed between Smyrna Landing and Delaware Bay. After due advertisement proposals were opened on

May 4, 1907, for this and other streams in Delaware emptying into Delaware Bay, and contract dated May 14, and approved May 22, 1907, made with The Rickards Dredging Company, of Philadelphia, Pa., the lowest bidder, at 16 cents per cubic yard, place measurement. Work under this contract was begun on June 10 and continued to June 24, 1907, when the contract was closed. During this period the channel was dredged between the steamboat landing at Smyrna and a point about 2,400 feet below and at Brick Store reach, where a shoal 600 feet in length with an average width of 38 feet was removed. The width made in these operations was 50 feet and the depth 7 feet at mean low water, which included 1 foot for overdepth allowed by the contract. This was the extent to which the work could be carried with the available funds. The quantity of material removed is 10,495 cubic yards, measured in place, and consisted principally of mud in the upper river and of drift sand with a small percentage of mud in the Brick Store reach. It was all deposited upon the adjacent banks above the high-water line.

*Money statement.*

July 1, 1906, balance unexpended.....		\$2, 238. 44
Amount appropriated by river and harbor act approved March 2, 1907.....		2, 000. 00
		4, 238. 44
June 30, 1907, amount expended during fiscal year:		
For maintenance of improvement.....	\$1, 676. 12	
Returned to Treasury.....	585. 79	
		2, 261. 91
July 1, 1907, balance unexpended.....		1, 976. 53
July 1, 1907, outstanding liabilities.....		1, 785. 00
		191. 53
{ Amount that can be profitably expended in fiscal year ending June 30, 1909, for maintenance of improvement, in addition to the balance unexpended July 1, 1907.....		
		3, 250. 00
{ Submitted in compliance with requirements of sundry civil act of June 4, 1897, and of section 7 of the river and harbor act of 1899.		

APPROPRIATIONS.

Project of 1878:		
June 14, 1880.....	\$5, 000	
March 3, 1881.....	3, 000	
August 2, 1882.....	2, 000	
		\$10, 000
Project of 1887:		
August 11, 1888.....	10, 000	
September 19, 1890.....	5, 000	
July 13, 1892.....	3, 000	
August 18, 1894.....	5, 000	
June 3, 1896.....	5, 000	
March 3, 1899.....	5, 000	
June 13, 1902.....	15, 000	
June 13, 1902 (allotment).....	6, 000	
March 3, 1905.....	5, 365	
March 3, 1905 (allotment).....	1, 600	
March 2, 1907.....	2, 000	
		62, 965
Total.....		72, 965
Returned to Treasury to June 30, 1907.....		4, 157. 37

## CONTRACT IN FORCE.

Contract dated May 14, and approved May 22, 1907, with The Rickards Dredging Company, of Philadelphia, Pa., for dredging, at 16 cents per cubic yard, place measurement. Amount available, \$1,800. Work began June 10, and was completed June 24, 1907.

## COMMERCIAL STATISTICS FOR CALENDAR YEAR ENDING DECEMBER 31, 1906.

*Receipts and shipments.*

Class.	Quantity.	Value.
<b>Receipts:</b>	<i>Tons.</i>	
Raw bone, coal, iron ore, phosphate rock, etc.....	7,410	\$35,450
Canned goods, fertilizers, flour, millwork, etc.....	10,040	254,000
Butter, corn, wheat, oats, cattle, hogs, etc.....	52,449	505,500
General merchandise.....	10,000	1,000,000
<b>Total.....</b>	<b>79,899</b>	<b>1,844,950</b>
<b>Shipments:</b>		
Railroad ties, ship timber, etc.....	76,520	212,000
Canned goods, flour, millwork, etc.....	9,770	349,000
Fruit, grain, cattle, poultry, etc.....	28,832	1,516,500
General merchandise.....	12,000	1,200,000
<b>Total.....</b>	<b>127,122</b>	<b>3,277,500</b>
<b>Total receipts and shipments.....</b>	<b>207,021</b>	<b>5,122,450</b>

*Vessels sailing and trading in Smyrna River, Delaware.*

Class.	No.	Aggregate tonnage.	Draft.	Remarks.
			<i>Feet.</i>	
Steamer.....	1	234	6	9 months triweekly; balance of year daily.
Do.....	1	100	6	3 months daily; balance of year irregularly.
Gasoline barge.....	1	50	6	Irregularly.
Do.....	1	200	6	Do.
<b>Total.....</b>	<b>4</b>	<b>584</b>		

In addition to foregoing, 5 tugs with floats and barges, a number of schooners, and a large number of fishing vessels trade in the river.

Vessels of 100 tonnage were repaired during the year.

The foregoing statistics were furnished by A. E. Jardine, secretary Philadelphia and Smyrna Transportation Company, Smyrna, Del.

## I 14.

## IMPROVEMENT OF BROADKILL RIVER, DELAWARE.

Under date of March 19, 1907, the Chief of Engineers approved a project for the expenditure of the available funds by cutting a new outlet across Lewes Cape, about one-fourth mile north of the confluence of Broadkill River and Lewes Creek; the opening up of the old channel of Lewes Creek to permit the free flow of its waters through the new mouth, and the construction for its protection of

a jetty on the north side, extending out into Delaware Bay beyond the 6-foot depth—across Lewes Cape, a timber revetment, and across Lewes Sound to its western shore as a dike.

Only the preliminary steps have been taken for beginning the work, as title to a piece of land required for the cut at the mouth has not yet been approved. It is expected, however, that this approval will be obtained soon and the work commenced.

The water traffic this year between Milton and points in Delaware and Pennsylvania is reported to be valued at \$1,085,000. The water rates are about two-thirds of those by rail. These rates are not expected to be lowered by the improvement of the stream, but better service will make them of more value to the community and increase the stated value of freight by at least 150 per cent.

No contract in force.

#### *Money statement.*

Amount appropriated by river and harbor act approved March 2, 1907.	\$33,330.00
June 30, 1907, amount expended during fiscal year, for works of improvement	75.54
July 1, 1907, balance unexpended	33,254.46
Amount (estimated) required for completion of existing project	66,605.00
Amount that can be profitably expended in fiscal year ending June 30, 1909, in addition to the balance unexpended July 1, 1907:	
For works of improvement	\$40,575.00
For maintenance of improvement	1,500.00
	42,075.00
Submitted in compliance with requirements of sundry civil act of June 4, 1897, and of section 7 of the river and harbor act of 1899.	

#### APPROPRIATION.

Act approved March 2, 1907..... \$33,330

#### I 15.

#### REMOVING SUNKEN VESSELS OR CRAFT OBSTRUCTING OR ENDANGERING NAVIGATION.

*Wrecks of steamer Ranald and barge Baker in the Atlantic Ocean, off Atlantic City, N. J.*—Upon the petition of a number of masters and owners of vessels, an examination was authorized on November 20, 1906. The *Ranald* was an iron hull steamer, about twenty years old, when she foundered on June 3, 1901, and was then stated to be loaded with asphalt. Proposals for the removal of the wreck were opened in August, 1901, but upon another examination then made the wreck was found to have settled in the sand, the least depth of water over it being 16 feet, and as it was not in the general course of coasting vessels, no further action was taken for its removal. In June, 1905, a second complaint was made relative to this wreck by several captains of vessels navigating the waters around Atlantic City. There-



upon an examination was again made, two of the complaining captains, who stated they were well acquainted with the location of the wreck, assisting therein; but no trace of the wreck could be found. The matter was then again dropped. Upon this present, the third complaint, an examination was made on November 16, 1906, and the wreck was discovered somewhat to the south of its original position, portions of the hull projecting above the bottom. On the highest of these but 9 feet of water at low tide was found.

The barge *Baker* caught fire at sea in the fall of 1905 and the hull drifted ashore in November of that year. It was found lying  $1\frac{1}{2}$  miles offshore, opposite the foot of Mississippi avenue, Atlantic City, in 19 feet of water, with its hull awash at low tide.

Allotments amounting to \$10,015 were made for the removal of these wrecks. With the view of advertising for the work of removal, a more detailed examination was entered upon, and although four of the complainants, who stated they knew the exact locations and could find them by ranges from the shore, assisted in the search for them, neither of the two wrecks could be found. A very severe storm occurred between the examinations, during which, it is believed, the wrecks were broken up and carried away. A great deal of wreckage was reported on the beach after the storm. Under these circumstances no further action was considered necessary, and the unexpended balance of the allotment was returned to the Treasury. The amount expended for the examinations was \$100.68.



## APPENDIX J.

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IMPROVEMENT OF PATAPSCO RIVER AND BALTIMORE HARBOR, MARYLAND; OF RIVERS AND HARBORS IN MARYLAND ON THE EASTERN SHORE OF CHESAPEAKE BAY; OF NANTICOKE RIVER, MARYLAND AND DELAWARE, AND OF BROAD CREEK RIVER, DELAWARE.

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REPORT OF COL. R. L. HOXIE, CORPS OF ENGINEERS, OFFICER IN CHARGE, FOR THE FISCAL YEAR ENDING JUNE 30, 1907.

### IMPROVEMENTS.

- |  |   |
|--|---|
| 1. Patapsco River and channel to Baltimore, Maryland.                    | 6. Harbors at Rockhall, Queenstown, Clalborne, and Cambridge, and Chester, Choptank, Warwick, Pocomoke, La Trappe, and Manokin rivers, and Tyaskin Creek, Maryland. |
| 2. Channel to Curtis Bay, in Patapsco River, Baltimore Harbor, Maryland. | 7. Nanticoke River, Delaware and Maryland.  |
| 3. Harbor of Southwest Baltimore (Spring Garden), Maryland.              | 8. Broad Creek River, Delaware.   |
| 4. Elk River, Maryland.  | 9. Wicomico River, Maryland.  |
| 5. Susquehanna River above and below Havre de Grace, Maryland.           | 10. Crisfield Harbor, Maryland.   |

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UNITED STATES ENGINEER OFFICE,  
*Baltimore, Md., July 6, 1907.*

GENERAL: I have the honor to forward herewith the annual reports for the year ended June 30, 1907, for the works of improvement of rivers and harbors in my charge.

Very respectfully, your obedient servant,

R. L. HOXIE,  
*Colonel, Corps of Engineers.*

Brig. Gen. A. MACKENZIE,  
*Chief of Engineers, U. S. A.*

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### J 1.

IMPROVEMENT OF PATAPSCO RIVER AND CHANNEL TO BALTIMORE, MARYLAND.

Continuing contracts were in progress with Charles W. Eaton, dated June 10, 1905, for dredging soft material, at 6.45 cents per cubic yard, and with the Maryland Dredging and Contracting Company,

dated July 5, 1905, for dredging hard material in the sections of the channel near Baltimore, Md., at 20 cents per cubic yard, and in the proposed channel opposite York Spit, at 23 cents per cubic yard.

The contractor for soft material continued work, except for an interval between January 24 and March 18, 1907, when ice interfered, with two dredges of the clam-shell type which, working night and day, removed 3,795,681 cubic yards from the Fort McHenry, Brewerton, and Cut-off divisions of the channel. The contractor for hard material continued work, except for an interval from December 22, 1906, to March 30, 1907, when ice interfered, with two dredges of the nonself-propelling suction type and one dredge of the endless bucket or elevator type, the former at York Spit and the latter in the channel near Baltimore. They removed 747,671 cubic yards at York Spit and 566,656 cubic yards from the Cut-off division.

The total amount of material removed during the fiscal year is 5,110,008 cubic yards.

With the completion of this project there will be an artificial channel 35 feet deep and 600 feet wide from Baltimore Harbor to deep water in Chesapeake Bay, a distance of about 19 miles, and a natural channel averaging 2 miles wide with a least depth of 40 feet and maximum depth varying to 20 fathoms down to the sea, excepting at York Spit, where a dredged channel 35 feet deep and 600 feet wide is provided for a distance of about  $4\frac{1}{2}$  miles. It has been shown that the cost of maintenance of the dredged channel near Baltimore is insignificant, averaging less than \$10,000 per annum since 1903. During the  $3\frac{1}{2}$  months that the dredges were withdrawn for the winter at York Spit no shoaling occurred that could be detected. If the record of a few years should show that the York Spit channel will be readily maintained at small cost, Baltimore will have an enviable position upon tidewater. If the consequent development of her commerce shall justify it, a 40-foot channel can then be as readily created and maintained.

#### *Money statement.*

July 1, 1906, balance unexpended.....	\$549, 552. 74
Amount appropriated by river and harbor act approved March 2, 1907.....	500, 000. 00
Amount appropriated by sundry civil act approved March 4, 1907....	500, 000. 00
	<hr/>
	1, 549, 552. 74
June 30, 1907, amount expended during fiscal year, for works of improvement.....	569, 424. 62
July 1, 1907, balance unexpended.....	980, 128. 12
July 1, 1907, outstanding liabilities.....	3, 242. 25
	<hr/>
July 1, 1907, balance available.....	976, 885. 87
July 1, 1907, amount covered by uncompleted contracts.....	236, 451. 66
Amount (estimated) required for completion of existing project....	1, 715, 000. 00
	<hr/>
{ Amount that can be profitably expended in fiscal year ending June 30, 1909, for works of improvement, in addition to the balance unexpended July 1, 1907.....	800, 000. 00
{ Submitted in compliance with requirements of sundry civil act of June 4, 1897.	

The following are the amounts and dates of appropriations for improving harbor at Baltimore, Md., including Patapsco River and Chesapeake Bay:

August 30, 1852-----	\$20,000	July 5, 1884-----	\$250,000
August 15, 1856-----	100,000	August 5, 1886-----	150,000
June 28, 1864-----	20,000	August 11, 1888-----	300,000
June 23, 1866-----	5,200	September 19, 1890-----	340,000
March 3, 1867-----	75,000	March 3, 1891-----	151,200
July 25, 1868-----	17,000	August 5, 1892-----	208,000
April 10, 1869-----	26,730	August 18, 1894-----	50,000
July 11, 1870-----	42,900	June 3, 1896-----	400,000
March 3, 1871-----	50,000	June 3, 1896-----	50,000
June 10, 1872-----	100,000	March 3, 1899-----	200,000
March 3, 1873-----	200,000	June 6, 1900-----	324,648
June 23, 1874-----	75,000	March 3, 1901-----	475,352
March 3, 1875-----	75,000	June 13, 1902-----	25,000
August 14, 1876-----	75,000	March 3, 1905-----	250,000
June 18, 1878-----	75,000	June 30, 1906-----	500,000
March 3, 1879-----	160,000	March 2, 1907-----	300,000
June 14, 1880-----	100,000	March 4, 1907-----	500,000
March 3, 1881-----	150,000		
August 2, 1882-----	450,000	Total -----	6,491,030

#### CONTRACTS IN FORCE.

Contract with Charles W. Eaton for dredging an estimated quantity of 7,102,222 cubic yards of soft material at 6.45 cents per cubic yard, approved July 24, 1905, date of commencement August 7, 1905, and of expiration July 30, 1907.

Contract with the Maryland Dredging and Contracting Company for dredging an estimated quantity of 719,999 cubic yards of hard material in Patapsco River at 20 cents per cubic yard, and an estimated quantity of 1,552,779 cubic yards hard material off York Spit, Chesapeake Bay, at 23 cents per cubic yard, approved July 18, 1905; date of commencement July 5, 1905, and of expiration August 19, 1908.

#### COMMERCIAL STATISTICS FOR FISCAL YEAR ENDED JUNE 30, 1907.

##### Imports.

Year.	Free.	Dutiable.	Total.
1906-----	\$14,818,075	\$16,386,942	\$30,655,017
1907-----	16,098,698	19,115,088	35,213,796
Increase ..	1,780,623	2,778,166	4,568,779

##### Imports in American vessels, 1907:

Sailing -----	\$581,370
Steam -----	258,927

##### Imports in foreign vessels, 1907:

Sailing -----	142,723
Steam -----	34,200,623

##### Imports in cars overland-----

30,153

Total ----- 35,213,796

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## Domestic exports.

In American vessels, 1907:		
Sailing	-----	\$65, 266
Steam	-----	7, 309
In foreign vessels, 1907:		
Sailing	-----	83, 226
Steam	-----	104, 328, 739
Total	-----	104, 484, 540

## Principal articles exported.

Articles.	Tons.	Articles.	Tons.
Cattle.....	21, 875	Beef products.....	6, 182
Grain.....	688, 818	Pork products.....	4, 458
Flour.....	151, 643	Lard.....	33, 685
Coal.....	491, 468	Oleo and oleomargarine.....	10, 389
Copper.....	61, 459	Starch.....	565
Cotton, unmanufactured.....	37, 610	Rosin.....	7, 155
Glucose.....	1, 557	Tobacco.....	44, 863
Iron and steel.....	121, 000	Oils.....	28, 485
Oilcake.....	48, 202	Wood, and manufactures of.....	98, 844

Amount of duties collected in 1907.....	\$5,066, 761. 36
Miscellaneous customs receipts in 1907.....	230, 213. 92
Total receipts in 1907.....	5, 296, 975. 28
Duties on merchandise in bond in 1907.....	97, 953. 90

## Summary of duties for 1907.

Imports and miscellaneous customs receipts.....	\$5, 296, 975. 28
Duties on merchandise remaining in bond.....	97, 953. 90
Merchandise transported with appraisement.....	5, 341. 01
Total.....	5, 400, 270. 19

## Statistical recapitulation.

Dutiable imports have increased.....	\$2, 778, 156. 00
Free imports have increased.....	1, 780, 623. 00
Domestic exports have decreased.....	5, 316, 578. 00
Tonnage (foreign and coastwise) has increased..... tons.....	171, 105
Duties collected have increased.....	\$345, 373. 24
Duties on merchandise in bond have decreased.....	427. 60
Duties on merchandise in bond with and without appraisement have increased.....	363, 308. 45

## Tonnage movement, years ended June 30, 1906 and 1907.

	July 1, 1905, to June 30, 1906.		July 1, 1906, to June 30, 1907.	
	Number.	Tons.	Number.	Tons.
Foreign trade:				
Entered.....	848	1, 548, 590	772	1, 419, 782
Cleared.....	831	1, 611, 772	782	1, 500, 118
Coastwise trade:				
Entered.....	1, 588	2, 414, 582	1, 667	2, 576, 209
Cleared.....	2, 067	2, 702, 154	2, 161	2, 962, 144

## Passengers.

1905-6.....	54, 672
1906-7.....	68, 340

*Vessels built 1906-7.*

Class.	Number.	Tons.	Value.
Steam .....	9	4,080	\$672,000
Sail .....	1	630	15,000
Barges .....	9	5,062	329,000
Total .....	19	9,722	916,000

**J 2.****IMPROVEMENT OF CHANNEL TO CURTIS BAY, IN PATAPSCO RIVER, BALTIMORE HARBOR, MARYLAND.**

No dredging was done during the fiscal year. Examinations were made with a view to maintenance, which developed the fact that shoals had formed. It is proposed to expend the available funds for partial maintenance in removing shoals as far as balance in hand will permit.

*Money statement.*

July 1, 1906, balance unexpended .....	\$3,549.68
June 30, 1907, amount expended during fiscal year, for works of improvement .....	233.04
July 1, 1907, balance unexpended .....	3,316.64
July 1, 1907, outstanding liabilities .....	34.83
July 1, 1907, balance available .....	3,281.81
July 1, 1907, amount covered by uncompleted contracts .....	3,149.92
{ Amount that can be profitably expended in fiscal year ending June 30, 1909, for maintenance of improvement, in addition to the balance unexpended July 1, 1907 .....	4,000.00
{ Submitted in compliance with requirements of sundry civil act of June 4, 1897, and of section 7 of the river and harbor act of 1899.	

The following are the amounts and dates of appropriations for improving channel to Curtis Bay, in Patapsco River, Baltimore Harbor, Maryland:

July 13, 1892 .....	\$28,000
August 18, 1894 .....	12,000
June 13, 1902 .....	50,000
March 3, 1903 .....	146,000
Total .....	236,000

**CONTRACT IN FORCE.**

Contract with the Maryland Dredging and Contracting Company for dredging an estimated quantity of 19,687 cubic yards of material at 16 cents per cubic yard, approved June 29, 1907; date of commencement August 1, 1907, and of expiration November 1, 1907.

**COMMERCIAL STATISTICS.**

The statistics of the port of Baltimore include this harbor.

## J 3.

## IMPROVEMENT OF HARBOR OF SOUTHWEST BALTIMORE (SPRING GARDEN), MARYLAND.

No dredging was done in the fiscal year. An examination was made, which shows considerable deterioration of the channel, especially at the upper end. This channel was dredged in very soft material where silt has been slowly accumulating for many years. The cost of maintenance for a number of years will probably continue to be large, but after the side slopes have flattened out sufficiently, it is thought that the cost of maintenance will be much reduced.

*Money statement.*

Amount appropriated by river and harbor act approved March 2, 1907.	\$6,500.00
July 1, 1907, balance unexpended.....	6,500.00
July 1, 1907, outstanding liabilities.....	34.83
July 1, 1907, balance available.....	6,465.17
July 1, 1907, amount covered by uncompleted contracts.....	5,850.08
{ Amount that can be profitably expended in fiscal year ending June 30, 1909, for maintenance of improvement, in addition to the balance unexpended July 1, 1907.....	
Submitted in compliance with requirements of sundry civil act of June 4, 1897, and of section 7 of the river and harbor act of 1899.	31,000.00

The following are the amounts and dates of appropriations for improving harbor of Southwest Baltimore (Spring Garden), Md.:

June 23, 1896.....	\$5,000
June 13, 1902.....	88,000
March 3, 1903.....	221,000
March 2, 1907 (maintenance).....	6,500
Total .....	320,500

## CONTRACT IN FORCE.

Contract with the Maryland Dredging and Contracting Company for dredging an estimated quantity of 36,563 cubic yards of material at 16 cents per cubic yard, approved June 29, 1907; date of commencement August 1, 1907, and of expiration November 1, 1907.

## COMMERCIAL STATISTICS.

The statistics of the port of Baltimore include this harbor.



## J 4.

## IMPROVEMENT OF ELK RIVER, MARYLAND.

No dredging was done.

*Money statement.*

Amount appropriated by river and harbor act approved March 2, 1907	\$18,803.00
June 30, 1907, amount expended during fiscal year, for works of improvement	.91
July 1, 1907, balance unexpended	18,802.09
July 1, 1907, outstanding liabilities	15.75
July 1, 1907, balance available	18,786.34
July 1, 1907, amount covered by uncompleted contracts	16,922.70

## APPROPRIATIONS.

June 23, 1874	\$5,000	July 13, 1892	\$5,000
March 3, 1875	5,000	June 13, 1902	16,665
June 14, 1880	10,000	March 3, 1905	2,000
March 3, 1881	5,000	March 2, 1907	18,803
August 2, 1882	6,500		
September 19, 1890	10,000	Total	88,968

## CONTRACT IN FORCE.

Contract with the Maryland Dredging and Contracting Company for dredging an estimated quantity of 89,068 cubic yards of material at 19 cents per cubic yard, approved June 28, 1907; date of commencement July 29, 1907, and of expiration July 29, 1909.

## COMMERCIAL STATISTICS FOR CALENDAR YEAR ENDED DECEMBER 31, 1906.

*Receipts and shipments.*

Class.	Quantity.	Value.
<b>Receipts:</b>	<i>Tons.</i>	
Cord wood, etc.	10,372	\$98,400
Lumber, shingles, etc.	150	2,250
Total	10,522	96,650
<b>Shipments:</b>		
Fertilizers	1,007	15,105
Vessels built	3,500	85,000
Hay and flour	150	2,850
Total	4,657	102,955
Total receipts and shipments	15,179	198,605

Commerce was decreased owing to shoaling of channel making it impossible to get loaded vessels to wharves.

*Vessels sailing and trading in Elk River, Maryland.*

Class.	Number.	Aggregate tonnage.	Light draft.	Loaded draft.
Steam tugs.....	2	59	Fect. 6½	Fect. 7½
Schooners and barges.....	35	6,190	4½	9

## J 5.

## IMPROVEMENT OF SUSQUEHANNA RIVER ABOVE AND BELOW HAVRE DE GRACE, MD.

No dredging was done.

*Money statement.*

Amount appropriated by river and harbor act approved March 2, 1907. \$20,000.00

July 1, 1907, balance unexpended..... 20,000.00

July 1, 1907, outstanding liabilities..... 20.15

July 1, 1907, balance available..... 19,979.85

July 1, 1907, amount covered by uncompleted contracts..... 18,000.00

Amount (estimated) required for completion of existing project..... 54,500.00

{ Amount that can be profitably expended in fiscal year ending June 30, 1909, for works of improvement, in addition to the balance unexpended July 1, 1907..... 20,000.00  
 Submitted in compliance with requirements of sundry civil act of June 4, 1897.

## APPROPRIATIONS.

## Previous projects:

August 30, 1852 .....	\$10,000
June 23, 1866 .....	26,400
July 25, 1868 (allotment) .....	5,000
April 10, 1869 (allotment) .....	990
July 1, 1870 .....	12,000
June 14, 1880 .....	28,000
March 3, 1881 .....	15,000
	<u>\$97,390</u>

## Present project:

August 2, 1882 .....	25,000
July 5, 1884 .....	20,000
August 5, 1886 .....	6,000
August 11, 1888 .....	10,000
September 19, 1890 .....	4,000
July 13, 1892 .....	4,000
1879, allotment from general appropriation for examinations and surveys .....	500
August 18, 1894 .....	4,000
June 13, 1902 .....	10,000
March 3, 1905 .....	10,000
March 2, 1907 .....	20,000
	<u>113,500</u>
Aggregate .....	210,890

## CONTRACT IN FORCE.

Contract with the Maryland Dredging and Contracting Company for dredging an estimated quantity of 94,731 cubic yards of material at 19 cents per cubic yard, approved June 28, 1907; date of commencement July 29, 1907, and of expiration July 29, 1909.

## COMMERCIAL STATISTICS FOR CALENDAR YEAR ENDED DECEMBER 31, 1906.

*Receipts and shipments.*

Class.	Quantity.	Value.
<b>Receipts:</b>	<i>Tons.</i>	
Lumber .....	17,500	\$262,000
Sand .....	28,000	15,000
Merchandise .....	6,000	80,000
<b>Total</b> .....	51,500	\$357,000
<b>Shipments:</b>		
Granite .....	17,000	25,000
Salt fish .....	4,000	156,000
Sand .....	1,200	1,200
Agricultural products .....	115	8,000
<b>Total</b> .....	22,315	185,200
<b>Total receipts and shipments</b> .....	73,815	\$542,200

*Vessels sailing and trading in Susquehanna River, Maryland.*

Class.	Number.	Aggregate tonnage.	Light draft.	Loaded draft.
			<i>Fect.</i>	<i>Fect.</i>
Steamers .....	3	500	5	9
Sailing vessels .....	30	6,000	5	10
Barges .....	50	25,000	4	10

## J 6.

IMPROVEMENT OF HARBORS AT ROCKHALL, QUEENSTOWN, CLAIRBORNE, AND CAMBRIDGE; OF CHESTER, CHOPTANK, WARWICK, POCOMOKE, LA TRAPPE, AND MANOKIN RIVERS, AND OF TYASKIN CREEK, MARYLAND.

## (A) ROCKHALL HARBOR AND INNER HARBOR AT ROCKHALL.

No dredging was done during the fiscal year.

*Money statement.*

Amount appropriated by river and harbor act approved March 2, 1907 (allotment) .....	\$14,383.97
June 30, 1907, amount expended during fiscal year, for works of improvement .....	6.66
July 1, 1907, balance unexpended .....	14,377.31
July 1, 1907, outstanding liabilities .....	6.95
July 1, 1907, balance available .....	14,370.36
July 1, 1907, amount covered by uncompleted contracts .....	12,945.58
Amount (estimated) required for completion of existing project .....	21,711.03
<hr/>	
{ Amount that can be profitably expended in fiscal year ending June 30, 1909, for works of improvement, in addition to the balance unexpended July 1, 1907 .....	21,711.03
{ Submitted in compliance with requirements of sundry civil act of June 4, 1897.	

## APPROPRIATIONS.

June 3, 1896-----	\$16,600.00
June 13, 1902 (allotment) -----	12,000.00
March 3, 1905 (allotment) -----	12,829.35
March 2, 1907 (allotment) -----	14,383.97
Total -----	55,813.32

## CONTRACT IN FORCE.

Contract with the Maryland Dredging and Contracting Company for dredging an estimated quantity of 68,134 cubic yards of material at 19 cents per cubic yard, approved June 28, 1907; date of commencement July 29, 1907, and of expiration July 29, 1909.

## COMMERCIAL STATISTICS.

Statistics were requested but not furnished.

## (B) QUEENSTOWN HARBOR.

During the fiscal year no dredging was done.

*Money statement.*

Amount appropriated by river and harbor act approved March 2, 1907 (allotment) -----	\$4,975.70
July 1, 1907, balance unexpended -----	4,975.70
July 1, 1907, amount covered by uncompleted contracts -----	4,478.13
Amount (estimated) required for completion of existing project -----	4,304.15
<hr/>	
{ Amount that can be profitably expended in fiscal year ending June 30, 1909, for works of improvement, in addition to the balance unexpended July 1, 1907 -----	4,304.15
{ Submitted in compliance with requirements of sundry civil act of June 4, 1897. -----	

## APPROPRIATIONS.

March 3, 1871 -----	\$5,000.00	March 3, 1905 (allotment) -	\$4,606.50
June 10, 1872 -----	6,000.00	March 2, 1907 (allotment) -	4,975.70
March 3, 1879 -----	3,000.00		
June 3, 1896 -----	5,000.00	Total -----	40,582.20
June 13, 1902 (allotment) -	12,000.00		

## CONTRACT IN FORCE.

Contract with the Maryland Dredging and Contracting Company for dredging an estimated quantity of 23,569 cubic yards of material at 19 cents per cubic yard, approved June 28, 1907; date of commencement July 29, 1907, and of expiration July 29, 1909.

## COMMERCIAL STATISTICS FOR CALENDAR YEAR ENDED DECEMBER 31, 1906.

*Receipts and shipments.*

Class.	Quantity.	Value.
<b>Receipts:</b>	<b>Tons.</b>	
Lumber.....	616	\$18,480
Coal.....	216	1,612
General merchandise, etc.....	4,098	168,920
<b>Total.....</b>	<b>4,930</b>	<b>188,912</b>
<b>Shipments:</b>		
Agricultural products.....	14,057	508,280
Canned goods.....	588	42,640
Poultry and live stock.....	222	44,400
Fish and oysters.....	28	1,120
General merchandise, etc.....	88	1,620
<b>Total.....</b>	<b>14,878</b>	<b>651,960</b>
<b>Total receipts and shipments.....</b>	<b>19,808</b>	<b>838,872</b>

*Vessels sailing and trading in Queenstown Harbor, Maryland.*

Class.	Number.	Aggregate tonnage.	Light draft.	Loaded draft.
Steamers.....	6	2,260	Feet. 6	Feet. 8½
Sailing vessels and barges.....	175	5,200	4	12

## (C) CLAIBORNE HARBOR.

No dredging has been done since November 15, 1905.

*Money statement.*

Amount appropriated by river and harbor act approved March 2, 1907 (allotment).....	\$3,440.24
July 1, 1907, balance unexpended.....	3,440.24
July 1, 1907, amount covered by uncompleted contracts.....	3,096.22
Amount (estimated) required for completion of existing project.....	8,968.06
<hr/>	
{ Amount that can be profitably expended in fiscal year ending June 30, 1909, for works of improvement in addition to the balance unexpended July 1, 1907.....	8,968.06
{ Submitted in compliance with requirements of sundry civil act of June 4, 1897.	

## APPROPRIATIONS.

June 13, 1902 (allotment).....	\$15,000.00
March 3, 1905 (allotment).....	1,863.35
March 2, 1907 (allotment).....	3,440.24
<b>Total.....</b>	<b>20,303.59</b>

## CONTRACT IN FORCE.

Contract with the Maryland Dredging and Contracting Company for dredging an estimated quantity of 16,295 cubic yards of material at 19 cents per cubic yard, approved June 28, 1907; date of commencement July 29, 1907, and of expiration July 29, 1909.

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COMMERCIAL STATISTICS FOR CALENDAR YEAR ENDED DECEMBER 31, 1906.

## Receipts and shipments.

Class.	Quantity.	Value.
<b>Receipts:</b>	<i>Tons.</i>	
Lumber and ties .....	2,680	\$78,900
Coal.....	10,522	78,654
General merchandise, etc.....	72,694	2,907,780
<b>Total.....</b>	<b>85,846</b>	<b>3,060,314</b>
<b>Shipments:</b>		
Agricultural products.....	3,060	122,400
Canned goods.....	2,040	168,200
Poultry and live stock.....	471	94,200
Fish and oysters.....	510	20,400
General merchandise, etc.....	30	1,200
<b>Total.....</b>	<b>6,111</b>	<b>401,400</b>
<b>Total receipts and shipments.....</b>	<b>91,957</b>	<b>3,461,714</b>

## Vessels sailing and trading in Claiborne Harbor, Maryland.

Class.	Number.	Aggregate tonnage.	Light draft.	Loaded draft.
			<i>Fect.</i>	<i>Fect.</i>
Steamers.....	3	1,740	7	9
Sailing vessels and barges.....	70	3,960	4	10

## (D) CAMBRIDGE HARBOR.

No dredging was done during the fiscal year.

## Money statement.

July 1, 1906, balance unexpended.....	\$67.59
Amount appropriated by river and harbor act approved March 2, 1907 (allotment).....	1,531.63
	1,599.22
June 30, 1907, amount expended during fiscal year, for works of improvement .....	67.59
July 1, 1907, balance unexpended.....	1,531.63
July 1, 1907, amount covered by uncompleted contracts.....	1,378.47
Amount (estimated) required for completion of existing project....	6,205.82
{ Amount that can be profitably expended in fiscal year ending June 30, 1909, for works of improvement, in addition to the balance unexpended July 1, 1907.....	6,205.82
{ Submitted in compliance with requirements of sundry civil act of June 4, 1897.	

## APPROPRIATIONS.

March 3, 1871.....	\$10,000.00	June 13, 1892.....	\$7,737.00
June 10, 1872.....	10,000.00	June 13, 1902 (allotment) ..	3,000.00
March 3, 1873.....	5,000.00	March 3, 1905 (allotment) ..	3,120.80
June 18, 1878.....	5,000.00	March 2, 1907 (allotment) ..	1,531.63
March 3, 1879.....	2,500.00		
August 11, 1888.....	5,000.00	<b>Total.....</b>	<b>57,889.43</b>
September 19, 1890.....	5,000.00		

## CONTRACT IN FORCE.

Contract with the Maryland Dredging and Contracting Company for dredging an estimated quantity of 7,255 cubic yards of material at 19 cents per cubic yard, approved June 28, 1907; date of commencement July 29, 1907, and of expiration July 29, 1909.

## COMMERCIAL STATISTICS FOR CALENDAR YEAR ENDED DECEMBER 31, 1906.

*Receipts and shipments.*

Class.	Quantity.	Value.
<b>Receipts:</b>	<i>Tons.</i>	
Lumber.....	170	\$5,100
Coal.....	210	1,470
General merchandise, etc.....	86,300	8,452,000
<b>Total.....</b>	<b>86,680</b>	<b>8,458,570</b>
<b>Shipments:</b>		
Agricultural products.....	8,810	352,400
Canned goods.....	3,617	289,360
Poultry and live stock.....	55	11,000
Fish and oysters.....	540	21,600
General merchandise, etc.....	1,960	78,400
<b>Total.....</b>	<b>14,982</b>	<b>752,760</b>
<b>Total receipts and shipments.....</b>	<b>101,662</b>	<b>4,211,830</b>

*Vessels sailing and trading in Cambridge Harbor, Maryland.*

Class.	Number.	Aggregate tonnage.	Light draft.	Loaded draft.
<b>Steamers.....</b>	<b>6</b>	<b>2,461</b>	<i>Feet.</i> <b>5</b>	<i>Feet.</i> <b>9</b>
<b>Sailing vessels and barges.....</b>	<b>130</b>	<b>8,560</b>	<b>4</b>	<b>12</b>

## (E) CHESTER RIVER, MARYLAND, FROM CRUMPTON TO JONES LANDING.

No dredging has been done since September 13, 1905.

*Money statement.*

July 1, 1906, balance unexpended.....	\$49.51
Amount appropriated by river and harbor act approved March 2, 1907 (allotment).....	2,417.36
	2,466.87
June 30, 1907, amount expended during fiscal year, for works of improvement.....	49.51
July 1, 1907, balance unexpended.....	2,417.36
July 1, 1907, amount covered by uncompleted contracts.....	2,175.63
{ Amount that can be profitably expended in fiscal year ending June 30, 1909, for maintenance of improvement, in addition to the balance unexpended July 1, 1907.....	3,000.00
{ Submitted in compliance with requirements of sundry civil act of June 4, 1897, and of section 7 of the river and harbor act of 1899.	

## APPROPRIATIONS.

September 19, 1890.....	\$5,000.00	June 13, 1902 (allotment) ..	\$5,402.00
July 13, 1892.....	3,000.00	March 3, 1905 (allotment) ..	1,245.00
August 18, 1894.....	1,500.00	March 2, 1907 (allotment) ..	2,417.86
June 3, 1896.....	1,500.00		
March 3, 1899.....	3,200.00	Total .....	23,264.86

## CONTRACT IN FORCE.

Contract with the Maryland Dredging and Contracting Company for dredging an estimated quantity of 11,450 cubic yards of material at 19 cents per cubic yard, approved June 28, 1907; date of commencement July 29, 1907, and of expiration July 29, 1909.

## COMMERCIAL STATISTICS FOR CALENDAR YEAR ENDED DECEMBER 31, 1906.

*Receipts and shipments.*

Class.	Quantity.	Value.
<b>Receipts:</b>	<i>Tons.</i>	
Lumber.....	1,109	\$33,270
Coal.....	700	4,900
General merchandise, etc.....	14,400	576,000
Total.....	16,209	614,170
<b>Shipments:</b>		
Agricultural products.....	22,480	899,200
Canned goods.....	1,180	90,400
Poultry and live stock.....	5,100	1,020,000
Fish and oysters.....	2,966	118,640
General merchandise, etc.....	814	12,588
Total.....	31,990	2,140,800
Total receipts and shipments.....	48,199	2,754,970

*Vessels sailing and trading in Chester River, Maryland.*

Class.	Number.	Aggregate tonnage.	Light draft.	Loaded draft.
			<i>Fect.</i>	<i>Fect.</i>
Steamers.....	6	2,260	6	8½
Sailing vessels and barges.....	175	5,200	4	12

## (F) CHOPTANK RIVER.

No dredging has been done since March 1, 1906.



*Money statement.*

July 1, 1906, balance unexpended.....	\$55. 15
Amount appropriated by river and harbor act approved March 2, 1907 (allotment).....	9,662. 55
	9,717. 70
June 30, 1907, amount expended during fiscal year, for works of improvement.....	55. 15
July 1, 1907, balance unexpended.....	9,662. 55
July 1, 1907, amount covered by uncompleted contracts.....	8,696. 30
Amount (estimated) required for completion of existing project.....	1,948. 24
Amount that can be profitably expended in fiscal year ending June 30, 1909, for works of improvement, in addition to the balance unexpended July 1, 1907.....	
Submitted in compliance with requirements of sundry civil act of June 4, 1897.	
	1,948. 24

## APPROPRIATIONS.

June 14, 1880.....	\$5,000. 00	August 18, 1894.....	\$2,000. 00
March 3, 1881.....	5,000. 00	June 3, 1896.....	2,000. 00
August 2, 1882.....	5,000. 00	March 3, 1899.....	8,000. 00
July 5, 1884.....	5,000. 00	June 13, 1902 (allotment).....	3,000. 00
August 5, 1886.....	10,000. 00	March 3, 1905 (allotment).....	7,885. 00
August 11, 1888.....	7,500. 00	March 2, 1907 (allotment).....	9,662. 55
September 19, 1890.....	7,500. 00		
July 13, 1892.....	3,000. 00	Total.....	80,547. 55

## CONTRACT IN FORCE.

Contract with the Maryland Dredging and Contracting Company for dredging an estimated quantity of 45,770 cubic yards of material, at 19 cents per cubic yard, approved June 28, 1907; date of commencement July 29, 1907, and of expiration July 29, 1909.

## COMMERCIAL STATISTICS FOR CALENDAR YEAR ENDED DECEMBER 31, 1906.

*Receipts and shipments.*

Class.	Quantity.	Value.
<b>Receipts:</b>	<b>Tons.</b>	
Lumber.....	5,523	\$165,690
Coal.....	5,045	35,315
General merchandise, etc.....	131,861	5,274,440
Total.....	142,429	5,475,445
<b>Shipments:</b>		
Agricultural products.....	40,108	1,604,320
Canned goods.....	15,799	1,263,920
Poultry and live stock.....	520	104,000
Fish and oysters.....	1,970	78,800
General merchandise, etc.....	7,670	356,800
Total.....	66,067	3,407,840
Total receipts and shipments.....	208,496	8,883,285

*Vessels sailing and trading in Choptank River, Maryland.*

Class.	Number.	Aggregate tonnage.	Light draft.	Loaded draft.
Steamers.....	6	2,461	<i>Feet.</i> 5	<i>Feet.</i> 9
Sailing vessels and barges.....	245	6,800	4	12

## (G) WARWICK RIVER.

No dredging has been done since December 21, 1905.

*Money statement.*

July 1, 1906, balance unexpended.....	\$40. 82
Amount appropriated by river and harbor act approved March 2, 1907 (allotment) .....	3,493. 87
	<u>3,534. 69</u>
June 30, 1907, amount expended during fiscal year, for works of improvement .....	40. 82
July 1, 1907, balance unexpended.....	<u>3,493. 87</u>
July 1, 1907, amount covered by uncompleted contracts.....	<u>3,144. 49</u>

## APPROPRIATIONS.

Previous project:	
June 14, 1880.....	\$3,000. 00
March 3, 1881.....	3,000. 00
	<u>\$6,000. 00</u>
Present project:	
July 13, 1892.....	6,000. 00
August 18, 1894.....	2,000. 00
June 3, 1896.....	2,000. 00
March 3, 1899.....	2,000. 00
June 13, 1902 (allotment) .....	4,000. 00
March 3, 1905 (allotment) .....	1,909. 00
March 2, 1907 (allotment) .....	3,493. 87
	<u>21,402. 87</u>
Total, both projects .....	<u>27,402. 87</u>

## CONTRACT IN FORCE.

Contract with the Maryland Dredging and Contracting Company for dredging an estimated quantity of 16,549 cubic yards of material, at 19 cents per cubic yard, approved June 28, 1907; date of commencement July 29, 1907, and of expiration July 29, 1909.

## COMMERCIAL STATISTICS FOR CALENDAR YEAR ENDED DECEMBER 31, 1906.

*Receipts and shipments.*

Class.	Quantity.	Value.
<b>Receipts:</b>	<b>Tons.</b>	
Lumber.....	465	\$13,350
Coal.....	568	3,976
General merchandise, etc.....	11,330	453,200
Total.....	12,363	471,126
<b>Shipments:</b>		
Agricultural products.....	45,000	1,800,000
Canned goods.....	1,100	88,000
Poultry and live stock.....	60	12,000
Fish and oysters.....	114	4,560
General merchandise, etc.....	1,390	55,600
Total.....	47,664	1,960,160
Total receipts and shipments.....	60,027	2,431,286

*Vessels sailing and trading in Warwick River, Maryland.*

Class.	Number.	Aggregate tonnage.	Light draft.	Loaded draft.
			<i>Fect.</i>	<i>Fect.</i>
Steamers.....	5	2,461	5	9
Sailing vessels and barges.....	78	1,720	4	8

## (H) POCOMOKE RIVER.

No dredging has been done since November 6, 1905.

*Money statement.*

July 1, 1906, balance unexpended.....	\$39. 06
Amount appropriated by river and harbor act approved March 2, 1907 (allotment).....	2,298. 60
	2,337. 66
June 30, 1907, amount expended during fiscal year, for works of im- provement.....	39. 06
July 1, 1907, balance unexpended.....	2,298. 60
July 1, 1907, amount covered by uncompleted contracts.....	2,068. 74

## APPROPRIATIONS.

June 18, 1878.....	\$10,000. 00	June 13, 1902 (allotment) ..	\$4,800. 00
March 3, 1879.....	2,500. 00	March 3, 1905 (allotment) ..	1,743. 00
August 5, 1886.....	8,000. 00	March 2, 1907 (allotment) ..	2,298. 60
June 3, 1896.....	5,000. 00		
March 3, 1899.....	3,000. 00	Total .....	37,841. 60

## CONTRACT IN FORCE.

Contract with the Maryland Dredging and Contracting Company for dredging an estimated quantity of 10,888 cubic yards of material, at 19 cents per cubic yard, approved June 28, 1907; date of commencement July 29, 1907, and of expiration July 29, 1909.

## COMMERCIAL STATISTICS FOR CALENDAR YEAR ENDED DECEMBER 31, 1906.

*Receipts and shipments.*

Class.	Quantity.	Value.
<b>Receipts:</b>	<i>Tons.</i>	
Lumber.....	800	\$24,000.00
Coal.....	1,440	10,080.00
General merchandise, etc.....	27,886	1,115,440.00
Total.....	30,126	1,149,520.00
<b>Shipments:</b>		
Cord wood, lumber, etc.....	13,100	898,000.00
Agricultural products.....	8,340	833,600.00
Canned goods.....	13,800	1,064,000.00
Poultry and live stock.....	306	61,200.00
Fish and oysters.....	30	1,200.00
General merchandise, etc.....	506	20,320.00
Total.....	35,584	1,578,320.00
Total receipts and shipments.....	65,710	3,022,840.00

*Vessels sailing and trading in Pocomoke River, Maryland.*

Class.	Number.	Aggregate tonnage.	Light draft.	Loaded draft.
Steamers.....	2	1,527	<i>Fect.</i> 4	<i>Fect.</i> 6½
Sailing vessels and barges.....	86	4,680	4	7

## (1) LA TRAPPE RIVER.

No dredging has been done since December 13, 1905.

*Money statement.*

July 1, 1906, balance unexpended.....	\$34.02
Amount appropriated by river and harbor act approved March 2, 1907 (allotment).....	2,135.39
	2,169.41
June 30, 1907, amount expended during fiscal year, for works of improvement.....	34.02
July 1, 1907, balance unexpended.....	2,135.39
July 1, 1907, amount covered by uncompleted contracts.....	1,921.85

## APPROPRIATIONS.

July 13, 1892.....	\$2,500.00
August 18, 1894.....	4,750.00
March 3, 1905 (allotment).....	1,867.50
March 2, 1907 (allotment).....	2,135.39
Total.....	11,252.89

## CONTRACT IN FORCE.

Contract with the Maryland Dredging and Contracting Company for dredging an estimated quantity of 10,115 cubic yards of material at 19 cents per cubic yard, approved June 28, 1907; date of commencement July 29, 1907, and of expiration July 29, 1909.

## COMMERCIAL STATISTICS FOR CALENDAR YEAR ENDED DECEMBER 31, 1906.

*Receipts and shipments.*

Class.	Quantity.	Value.
<b>Receipts:</b>	<i>Tons.</i>	
Lumber.....	1, 625	\$48, 750
Coal.....	1, 183	7, 881
General merchandise, etc.....	6, 525	261, 000
Total.....	9, 283	317, 631
<b>Shipments:</b>		
Agricultural products.....	3, 886	135, 440
Canned goods.....	725	58, 000
Poultry and live stock.....	30	6, 000
Fish and oysters.....	24	980
General merchandise, etc.....	140	5, 600
Total.....	4, 805	206, 000
Total receipts and shipments.....	13, 588	523, 631

*Vessels sailing and trading in La Trappe River, Maryland.*

Class.	Number.	Aggregate tonnage.	Light draft.	Loaded draft.
			<i>Feet.</i>	<i>Feet.</i>
Steamers.....	8	923	5	9
Sailing vessels and barges.....	81	2, 800	4	9

## (J) MANOKIN RIVER.

No dredging has been done since October 16, 1905.

*Money statement.*

July 1, 1906, balance unexpended.....	\$44. 14
Amount appropriated by river and harbor act approved March 2, 1907 (allotment).....	9, 160. 69
	9, 204. 83
June 30, 1907, amount expended during fiscal year, for works of improvement.....	44. 14
July 1, 1907, balance unexpended.....	9, 160. 69
July 1, 1907, amount covered by uncompleted contracts.....	8, 244. 62
Amount (estimated) required for completion of existing project.....	10, 399. 16
Amount that can be profitably expended in fiscal year ending June 30, 1909, for works of improvement in addition to the balance unexpended July 1, 1907.....	10, 399. 16
Submitted in compliance with requirements of sundry civil act of June 4, 1897.	

## APPROPRIATIONS.

September 19, 1890-----	\$7,500.00	March 3, 1905 (allotment)-	\$4,772.50
July 13, 1892-----	7,500.00	March 2, 1907 (allotment)-	9,160.69
August 18, 1894-----	4,000.00		
June 3, 1896-----	4,000.00	Total-----	38,433.19
March 3, 1899-----	1,500.00		

## CONTRACT IN FORCE.

Contract with the Maryland Dredging and Contracting Company for dredging an estimated quantity of 43,392 cubic yards of material, at 19 cents per cubic yard, approved June 28, 1907; date of commencement July 29, 1907, and of expiration July 29, 1909.

## COMMERCIAL STATISTICS.

These were asked for, but not obtained.

## (K) TYASKIN CREEK.

No dredging has been done since December 2, 1905.

*Money statement.*

July 1, 1906, balance unexpended-----	\$25.84
Amount appropriated by river and harbor act approved March 2, 1907 (allotment)-----	6,500.00
	6,525.84
June 30, 1907, amount expended during fiscal year, for works of improvement-----	25.84
July 1, 1907, balance unexpended-----	6,500.00
July 1, 1907, amount covered by uncompleted contracts-----	5,850.00

## APPROPRIATIONS.

June 13, 1902 (allotment)-----	\$8,000
March 3, 1905 (allotment)-----	2,158
March 2, 1907 (allotment)-----	6,500
Total-----	16,658

## CONTRACT IN FORCE.

Contract with the Maryland Dredging and Contracting Company for dredging an estimated quantity of 30,789 cubic yards of material, at 19 cents per cubic yard, approved June 28, 1907; date of commencement July 29, 1907, and of expiration July 29, 1909.

\* Of this amount \$2,000 is for work in the upper river not covered by project.

## COMMERCIAL STATISTICS FOR CALENDAR YEAR ENDED DECEMBER 31, 1906.

*Receipts and shipments.*

Class.	Quantity.	Value.
<b>Receipts:</b>	<i>Tons.</i>	
Lumber.....	80	\$800
Coal.....	40	280
General merchandise, etc.....	474	18,960
Total.....	544	20,140
<b>Shipments:</b>		
Agricultural products.....	191	7,640
Canned goods.....	177	14,160
Poultry and live stock.....	14	2,800
Fish and oysters.....	7	280
General merchandise, etc.....	12	480
Total.....	401	25,360
Total receipts and shipments.....	945	45,500

*Vessels sailing and trading in Tyaskin Creek, Maryland.*

Class.	Number.	Aggregate tonnage.	Light draft.	Loaded draft.
			<i>Feet.</i>	<i>Feet.</i>
Steamers.....	8	1,727	4	6½
Sailing vessels and barges.....	35	2,100	4	6

## J 7.

## IMPROVEMENT OF NANTICOKE RIVER, DELAWARE AND MARYLAND.

No dredging has been done since April 20, 1906.

*Money statement.*

July 1, 1906, balance unexpended.....	\$208.38
Amount appropriated by river and harbor act approved March 2, 1907.....	2,000.00
	2,208.38
June 30, 1907, amount expended during fiscal year, for works of improvement.....	208.38
July 1, 1907, balance unexpended.....	2,000.00
July 1, 1907 outstanding liabilities.....	16.55
July 1, 1907, balance available.....	1,983.45
July 1, 1907, amount covered by uncompleted contracts.....	1,800.00

## APPROPRIATIONS.

August 18, 1894.....	\$5,000	March 2, 1907.....	\$2,000
June 3, 1896.....	3,000		
March 3, 1899.....	3,000	Total.....	15,000
March 3, 1905.....	2,000		

\* See note to appropriations for Broad Creek River, Delaware.

## CONTRACT IN FORCE.

Contract with the Maryland Dredging and Contracting Company for dredging an estimated quantity of 9,473 cubic yards of material at 19 cents per cubic yard, approved June 28, 1907; date of commencement July 29, 1907, and of expiration July 29, 1909.

## COMMERCIAL STATISTICS FOR THE CALENDAR YEAR ENDED DECEMBER 31, 1906.

*Receipts and shipments.*

Class.	Quantity.	Value.
<b>Receipts:</b>	<i>Tons.</i>	
Lumber.....	28,566	\$856,980
Coal.....	15,760	110,320
General merchandise, etc.....	54,940	2,197,600
Total.....	99,266	8,164,900
<b>Shipments:</b>		
Agricultural products.....	10,175	407,000
Canned goods.....	8,200	656,000
Poultry and live stock.....	845	69,000
Fish and oysters.....	1,012	40,480
General merchandise, etc.....	850	14,000
Total.....	20,082	1,186,480
Total receipts and shipments.....	119,348	4,351,380

*Vessels sailing and trading in Nanticoke River, Delaware and Maryland.*

Class.	Number.	Aggregate tonnage.	Light draft.	Loaded draft.
			<i>Feet.</i>	<i>Feet.</i>
Steamers.....	3	1,727	4	6½
Sailing vessels and barges.....	120	12,300	4	12

## J 8.

## IMPROVEMENT OF BROAD CREEK RIVER, DELAWARE.

No dredging was done during the fiscal year; but shoaling has taken place and work of restoration will be commenced.

*Money statement.*

Amount appropriated by river and harbor act approved March 2, 1907.....	\$1,500. 00
July 1, 1907, balance unexpended.....	1,500. 00
July 1, 1907, outstanding liabilities.....	13. 55
July 1, 1907, balance available.....	1,486. 45
July 1, 1907, amount covered by uncompleted contracts.....	1,350. 00
Amount that can be profitably expended in fiscal year ending June 30, 1909, for maintenance of improvement in addition to the balance unexpended July 1, 1907.....	4,000. 00
Submitted in compliance with requirements of sundry civil act of June 4, 1897, and of section 7 of the river and harbor act of 1899.	



## APPROPRIATIONS.

<b>Previous project:</b>	
June 14, 1880.....	\$5, 000
March 3, 1881.....	10, 000
August 2, 1882.....	5, 000
August 5, 1886.....	10, 000
August 11, 1888.....	5, 000
	<b>\$35, 000</b>
<b>Present project:</b>	
July 13, 1892.....	5, 000
August 18, 1894.....	* 5, 000
June 3, 1896.....	5, 000
March 3, 1899.....	5, 000
March 2, 1907.....	1, 500
<b>Total.....</b>	<b>21, 500</b>
<b>Aggregate.....</b>	<b>56, 500</b>

## CONTRACT IN FORCE.

Contract with the Maryland Dredging and Contracting Company for dredging an estimated quantity of 7,105 cubic yards of material at 19 cents per cubic yard, approved June 28, 1907, date of commencement, July 29, 1907, and of expiration, July 29, 1909.

## COMMERCIAL STATISTICS FOR CALENDAR YEAR ENDED DECEMBER 31, 1908.

*Receipts and shipments.*

Class.	Quantity.	Value.
<b>Receipts:</b>		
Lumber, shingles, laths, etc.....	<i>Tons.</i> 21, 135	\$317, 000
Coal.....	400	8, 000
General merchandise.....	2, 000	250, 000
Phosphates.....	900	20, 000
<b>Total.....</b>	<b>24, 435</b>	<b>590, 000</b>
<b>Shipments:</b>		
Agricultural products.....	10	1, 250
Live stock.....	5	400
Eggs.....	25	3, 000
Lumber, grain, etc.....	4, 615	24, 000
<b>Total.....</b>	<b>4, 655</b>	<b>28, 650</b>
<b>Total receipts and shipments.....</b>	<b>29, 090</b>	<b>618, 650</b>

*Vessels sailing and trading in Broad Creek River, Delaware.*

Class.	Number.	Aggregate tonnage.	Light draft.	Loaded draft.
Steamers.....	1	60	<i>Feet.</i> 3	<i>Feet.</i> 7
Yachts.....	10	5	2	5
Sailing vessels.....	500	30, 000	4	9

\* This appropriation was applied to removing bar on Nanticoke River under the terms of the appropriation.

## J 9.

## IMPROVEMENT OF WICOMICO RIVER, MARYLAND.

No dredging done since May 24, 1906.

*Money statement.*

July 1, 1906, balance unexpended	\$57. 76
Amount appropriated by river and harbor act approved March 2, 1907	2, 500. 00
	<u>2, 557. 76</u>
June 30, 1907, amount expended during fiscal year, for works of improvement	57. 76
July 1, 1907, balance unexpended	2, 500. 00
July 1, 1907, amount covered by uncompleted contracts	2, 250. 00
	<u><u>3, 000. 00</u></u>
{ Amount that can be profitably expended in fiscal year ending June 30, 1909, for maintenance of improvement, in addition to the balance unexpended July 1, 1907— Submitted in compliance with requirements of sundry civil act of June 4, 1897, and of section 7 of the river and harbor act of 1899.	

## APPROPRIATIONS.

June 10, 1872	\$5, 000
March 3, 1873	5, 000
June 28, 1874	5, 000
March 3, 1875	5, 000
August 14, 1876	5, 000
June 18, 1878	5, 000
March 3, 1879	3, 000
June 14, 1880	5, 000
March 3, 1881	2, 000
July 5, 1884	10, 000
	<u>\$50, 000</u>
September 19, 1890	10, 000
July 13, 1892	6, 500
August 18, 1894	3, 000
June 3, 1896	3, 700
June 13, 1902 (allotment)	6, 798
March 3, 1905	5, 000
March 2, 1907	2, 500
	<u>37, 498</u>
Aggregate	87, 498

## CONTRACT IN FORCE.

Contract with the Maryland Dredging and Contracting Company for dredging an estimated quantity of 11,842 cubic yards of material at 19 cents per cubic yard, approved June 28, 1907. Date of commencement July 29, 1907, and of expiration July 29, 1909.

## COMMERCIAL STATISTICS FOR CALENDAR YEAR ENDED DECEMBER 31, 1906.

*Receipts and shipments.*

Class.	Quantity.	Value.
<b>Receipts:</b>	<i>Tons.</i>	
Lumber.....	33,840	\$970,200
Coal.....	18,600	130,200
General merchandise, etc.....	71,185	2,847,500
Total.....	122,125	3,947,900
<b>Shipments:</b>		
Agricultural products.....	10,814	412,560
Canned goods.....	9,282	742,560
Poultry and live stock.....	815	68,000
Fish and oysters.....	1,025	41,000
General merchandise, etc.....	55,890	2,215,600
Total.....	76,826	3,474,720
Total receipts and shipments.....	198,451	7,422,620

*Vessels sailing and trading in Wicomico River, Maryland.*

Class.	Number.	Aggregate tonnage.	Light draft.	Loaded draft.
			<i>Fect.</i>	<i>Fect.</i>
Steamers.....	2	1,548	5	6 1/2
Sailing vessels and barges.....	80	5,600	5	9

## J 10.

## IMPROVEMENT OF CRISFIELD HARBOR, MARYLAND.

No dredging has been done since May, 1876.

*Money statement.*

Amount appropriated by river and harbor act approved March 2, 1907.....	\$37,707.00
July 1, 1907, balance unexpended.....	37,707.00
July 1, 1907, outstanding liabilities.....	36.95
July 1, 1907, balance available.....	37,670.05
July 1, 1907, amount covered by uncompleted contracts.....	33,936.30

## APPROPRIATIONS.

March 3, 1875.....	\$37,317.50
March 2, 1907.....	37,707.00
Total.....	75,024.50

## CONTRACT IN FORCE.

Contract with the Maryland Dredging and Contracting Company for dredging an estimated quantity of 178,612 cubic yards of material, at 19 cents per cubic yard, approved June 28, 1907; date of commencement July 29, 1907, and of expiration July 29, 1909.

# 1162 REPORT OF THE CHIEF OF ENGINEERS, U. S. ARMY.

COMMERCIAL STATISTICS FOR CALENDAR YEAR ENDED DECEMBER 31, 1906.

## *Receipts and shipments.*

Class.	Quantity.	Value.
<b>Receipts:</b>	<i>Tons.</i>	
Lumber .....	800	\$9,000
Coal .....	500	8,500
General merchandise, etc. ....	17,351	694,040
<b>Total</b> .....	<b>18,151</b>	<b>706,540</b>
<b>Shipments:</b>		
Agricultural products .....	3,160	128,400
Canned goods .....	694	55,520
Poultry and live stock .....	150	30,000
Fish and oysters .....	7,040	281,800
General merchandise, etc. ....	1,070	42,800
<b>Total</b> .....	<b>12,114</b>	<b>538,520</b>
<b>Total receipts and shipments</b> .....	<b>30,265</b>	<b>1,242,860</b>

## *Vessels sailing and trading in Crisfield Harbor, Maryland.*

Class.	Number.	Aggregate tonnage.	Light draft.	Loaded draft.
			<i>Feet.</i>	<i>Feet.</i>
Steamers .....	8	6,400	5	7
Sailing vessels and barges .....	350	24,500	5	8

## APPENDIX K.

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IMPROVEMENT OF POTOMAC RIVER AND ITS TRIBUTARIES; OF JAMES RIVER AND OF HARBOR AT MILFORD HAVEN, VIRGINIA, AND OF CERTAIN RIVERS IN MARYLAND AND VIRGINIA ON THE WESTERN SHORE OF CHESAPEAKE BAY; CONSTRUCTION OF PIERS, HAMPTON ROADS, JAMESTOWN EXPOSITION; PERMANENT LANDING PIER, JAMESTOWN ISLAND, VIRGINIA.

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REPORT OF MAJ. SPENCER COSBY, CORPS OF ENGINEERS, OFFICER IN CHARGE, FOR THE FISCAL YEAR ENDING JUNE 30, 1907.

### IMPROVEMENTS.

- |   |   |
|---|---|
| 1. Potomac River, at Washington, District of Columbia.                          | 7. Rappahannock River, Virginia.  |
| 2. Potomac River, below Washington, District of Columbia.                       | 8. Urbana Creek, Virginia.  |
| 3. Anacostia River, District of Columbia.                                       | 9. Harbor at Milford Haven, Virginia.                                       |
| 4. Breton Bay, Maryland.  | 10. James River, Virginia.  |
| 5. York, Mattaponi, and Pamunkey rivers; Occoquan and Carters creeks, Virginia. | 11. Construction of Piers, Hampton Roads, Jamestown Exposition.             |
| 6. Nomini Creek, Virginia.  | 12. Permanent Landing Pier, Jamestown Island, Virginia.                     |
|   | 13. Removing sunken vessels or craft obstructing or endangering navigation. |
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UNITED STATES ENGINEER OFFICE,  
*Washington, D. C., July 10, 1907.*

GENERAL: I have the honor to forward herewith my annual report for the fiscal year ended June 30, 1907, for river and harbor works in my charge.

Very respectfully,

SPENCER COSBY,  
*Major, Corps of Engineers.*

Brig. Gen. A. MACKENZIE,  
*Chief of Engineers, U. S. A.*

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### K 1.

IMPROVEMENT OF POTOMAC RIVER AT WASHINGTON, DISTRICT OF COLUMBIA.

WORK OF THE FISCAL YEAR ENDED JUNE 30, 1907.

Dredging under contract with the Atlantic, Gulf and Pacific Company was begun July 20 and carried on continuously until October 5, 1906, when the limit of work which could be done with the funds

available was reached and the dredging was discontinued. At the completion of the work a channel 345 feet wide and 21 feet deep had been dredged entirely through the bar in the Washington channel except for a distance of about 1,100 feet, where the width is 210 feet for a 21-foot depth. The undredged portion of the channel has a depth of about 18 feet and is situated in front of the steamboat wharves, where a greater depth is not essential at present. The total amount of material excavated under this contract was 277,826 cubic yards, all of which was deposited upon Section III of Potomac Park. Upon the completion of the dredging the range piles were removed from the river and a small amount of grading was done back of the sea wall by the contractor. The cost of the dredging was 14.6 cents per cubic yard.

The engineer wharf at Easby Point was repaired in May, 1907. Oak fender piles were driven along the front and new flooring, guard timbers, and joists were laid. This work was done by hired labor.

A hydrographic survey was made of the Virginia channel and of the Tidal Reservoir and levels were taken over Potomac Park preliminary to preparing specifications for dredging under funds appropriated by act of March 2, 1907. Specifications for this dredging were gotten up.

Two sunken piles which were a menace to navigation were removed from the Virginia channel by hired labor.

About 35 cubic yards of stone removed from the Old Long Bridge were stored on Potomac Park for use in repairing the sea wall.

During the fiscal year about 150,000 cubic yards of good earth, free from objectionable matter, were dumped upon Potomac Park and graded by private parties, under permit, without cost to the United States, aside from inspection. This material was mainly deposited so as to fill low areas on Section III of the park and to form embankments along the river front, which will later be useful for retaining dredge spoil.

The river was frozen over for a few days during the winter, but this did not at any time seriously interfere with steam navigation.

The total expenditure during the fiscal year was \$45,317.42, all of which was applied to maintenance and divided as follows: Dredging in Washington channel and expenses incident thereto, \$43,372.75; survey of river and park, \$672.73; repairing wharf at Easby Point, \$582.76; removing sunken piles, \$20; inspection of dumping, \$188.50; and care of engineer property, \$480.68.

#### CHANNEL DEPTH.

The adopted project for this improvement does not specify the depth to be obtained in feet, but provides that the channels shall be of sufficient depth to accommodate the deepest draft vessels that can be brought up to them. At the time of the adoption of the project the ruling depth in the Potomac River below Washington was 20 feet, and all estimates for the improvement at Washington are based upon this depth. The least depth of channel in the lower Potomac has now been increased by dredging to 24 feet at low tide, which accordingly makes this the present projected depth for the improvement at Washington. For this increase the present estimates, how-

ever, do not make provision, and no work with this depth in view will be undertaken until it is authorized by Congress.

The desirability of extending the advantages of increased depth in the lower Potomac River at an early date, so that deep-draft vessels may reach the navy-yard and wharves at Washington, is obvious. Incidental to the deposit of the additional material thus excavated from the channel there would result the great advantage of raising the surface of Potomac Park above all possibility of injury by the highest known freshets. The estimated additional cost of this important modification of the project, which it is hoped will soon be authorized by Congress, was stated on page 1151 of the Annual Report of the Chief of Engineers for 1905.

#### POTOMAC PARK.

Congress, by act of March 3, 1897, declared the reclaimed flats a public park. This extensive tract, amounting to 621 acres of land and 118 acres of inclosed water area, is capable of being transformed into one of the finest parks in the country. The material to be dredged from the channel and tidal reservoir with funds now in hand will be deposited upon the park, a considerable area of which will thus be made available for park development.

#### APPROPRIATIONS.

It is strongly recommended that in response to the popular demand for better navigation facilities and for additional park space the appropriations for this work be made on a scale which will insure the completion of the entire project (including the increased channel depth recommended) within a few years.

A considerable appropriation is now necessary for maintenance and for the removal of freshet deposits alone.

#### *Money statement.*

July 1, 1906, balance unexpended .....	\$47,552.83
Amount appropriated by river and harbor act approved March 2, 1907..	258,000.00
Received from sale of blueprints .....	.50
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	305,553.33
June 30, 1907, amount expended during fiscal year, for maintenance of improvement .....	45,317.42
	<hr/>
July 1, 1907, balance unexpended .....	260,235.91
July 1, 1907, outstanding liabilities .....	221.80
	<hr/>
July 1, 1907, balance available .....	260,014.11
	<hr/>
Amount (estimated) required for completion of existing project...	490,953.85
	<hr/>
<div> <div> Amount that can be profitably expended in fiscal year ending June 30, 1909, in addition to the balance unexpended July 1, 1907: </div> <div> For works of improvement .....</div> <div> For maintenance of improvement .....</div> </div>	
	\$40,000.00
	210,000.00
	<hr/>
	250,000.00
<div> Submitted in compliance with requirements of sundry civil act of June 4, 1897, and of section 7 of the river and harbor act of 1899. </div>	

## APPROPRIATIONS.

## Previous projects:

June 11, 1870.....	\$50,000.00
March 3, 1873.....	50,000.00
June 18, 1878.....	50,000.00
March 3, 1879.....	50,000.00
June 14, 1880.....	40,000.00
March 3, 1881.....	50,000.00
<b>Total</b> .....	<b>290,000.00</b>

## Present project:

August 2, 1882.....	400,000.00
July 5, 1884.....	500,000.00
August 5, 1886.....	375,000.00
August 11, 1888.....	300,000.00
September 19, 1890.....	260,000.00
July 13, 1892.....	200,000.00
August 18, 1894.....	150,000.00
June 3, 1896.....	100,000.00
March 3, 1899 (appropriated, \$100,000; allotted Potomac River below Washington, \$26,000).....	74,000.00
June 13, 1902.....	75,000.00
April 28, 1904 (allotted).....	50,000.00
March 3, 1905.....	50,000.00
March 2, 1907.....	258,000.00
<b>Total</b> .....	<b>2,792,000.00</b>
Amount received from sale of blueprints.....	: 50
<b>Total</b> .....	<b>2,792,000.50</b>

## CONTRACT IN FORCE.

Contractor: The Atlantic, Gulf and Pacific Company, of New York, N. Y., for dredging.

Amount: 275,000 cubic yards.

Date of contract: November 24, 1905.

Approved: December 6, 1905.

Date for commencement: January 8, 1906.

Date for completion: Not less than 75,000 cubic yards to be excavated and deposited during each calendar month; time limit for completion waived.

Final payment under this contract was made October 31, 1906.

Rate: 14.6 cents per cubic yard.

## COMMERCIAL STATISTICS.

*Receipts and shipments by water, calendar year 1906.*

Articles.	Quantity.	Articles.	Quantity.
	<i>Tons.</i>		<i>Tons.</i>
Asphalt.....	3,800	Miscellaneous steamer freight.....	78,637
Bricks.....	11,250	Naphtha, oil, and gasoline.....	16,680
Cement.....	1,650	Oysters.....	13,350
Coal, anthracite.....	74,337	Sand and gravel.....	364,398
Coal, bituminous.....	160,566	Shingles.....	1,619
Coke.....	10,000	Stone.....	20,589
Fertilizer.....	3,800	Wood.....	35,500
Ice.....	38,044		
Laths.....	2,764	<b>Total</b> .....	<b>907,430</b>
Lumber.....	70,546		

The above list does not include the freight shipped on ferry boats to and from Alexandria, Va., which is estimated at 15,000 tons.



*Arrivals of vessels, calendar year 1906.*

Class.	Number.	Gross tonnage.
Steamers drawing 5 to 15 feet.....	1, 875	550, 000
Sailing vessels drawing 10 to 21 feet.....	280	420, 000
Sailing vessels drawing 4 to 10 feet.....	1, 800	270, 000
Barges drawing 16 to 18 feet.....	85	38, 500
Barges drawing 4 to 12 feet.....	8, 500	525, 000
Total.....	6, 990	1, 803, 500

Alexandria ferry boats and local passenger and excursion steamers are not included in the above list.

**K 2.****IMPROVEMENT OF POTOMAC RIVER BELOW WASHINGTON, DISTRICT OF COLUMBIA.**

WORK OF THE FISCAL YEAR ENDED JUNE 30, 1907.

The work of the fiscal year was limited to an occasional inspection of the locality and to miscellaneous office work, for which the total expenditure was \$117. This is regarded as a maintenance expenditure.

The river and harbor act approved March 2, 1907, provides for an examination of "Potomac River below Washington, with a view to obtaining a width of channel of four hundred feet." The examination will be made as soon as possible.

*Money statement.*

July 1, 1906, balance unexpended.....	\$1, 281. 00
June 30, 1907, amount expended during fiscal year, for maintenance of improvement .....	117. 00
July 1, 1907, balance unexpended.....	1, 164. 00
July 1, 1907, balance available.....	1, 164. 00

**APPROPRIATIONS.**

March 3, 1899 (by allotment from appropriation of \$100,000 for improving Potomac River, etc.).....	\$26, 000
June 6, 1900.....	52, 000
March 3, 1901.....	98, 000
March 3, 1905.....	10, 000
Total .....	186, 000

## COMMERCIAL STATISTICS.

[Collected by this office and by Mr. J. T. Preston, Alexandria, Va.]

*Receipts and shipments by water, calendar year 1906.*

Articles.	Quantity.	Articles.	Quantity.
	<i>Tons.</i>		<i>Tons.</i>
Asphalt.....	5,861	Naval ordnance and supplies.....	40,752
Bricks.....	11,250	Oysters.....	14,550
Brick clay.....	24,000	Paving blocks.....	8,003
Canned goods.....	758	Phosphate rock.....	10,392
Cement.....	1,650	Plaster.....	1,200
Coal, anthracite.....	94,337	Potash salt.....	5,448
Coal, bituminous.....	75,000	Piles.....	3,600
Coke.....	10,000	Railroad ties.....	6,000
Corn.....	780	Salt.....	150
Fertilizer.....	15,830	Sand and gravel.....	570,894
Fish.....	3,450	Shingles.....	1,519
Flour.....	500	Stone.....	22,000
General merchandise.....	121,381	Tar.....	80
Ice.....	52,044	Wheat.....	1,150
Laths.....	2,764	Wood.....	38,398
Lumber.....	88,361		
Naphtha, oil, and gasoline.....	47,379	Total.....	1,288,931

The above list does not include the freight shipped on ferryboats between Washington and Alexandria, which is estimated at 15,000 tons.

*Arrivals of vessels, calendar year 1906.*

Class.	Number.	Gross tonnage.
Steamers drawing over 10 feet.....	420	252,000
Steamers drawing less than 10 feet.....	1,175	412,500
Sailing vessels drawing over 10 feet.....	448	672,000
Sailing vessels drawing less than 10 feet.....	2,498	374,700
Barges drawing over 16 feet.....	85	38,500
Barges, flatboats, etc., drawing less than 12 feet.....	4,000	600,000
Total.....	8,576	2,349,700

Alexandria ferryboats and local passenger and excursion steamers are not included in the above list.

## K 3.

## IMPROVEMENT OF ANACOSTIA RIVER, DISTRICT OF COLUMBIA.

WORK OF THE FISCAL YEAR ENDED JUNE 30, 1907.

Proposals for dredging a trench (for the deposit of riprap stone along the margin of the fill) and for filling behind the riprap wall when constructed were invited March 22, and opened April 2, 1907. The only bid, that of John Miller, of Washington, D. C., at 13 and 18 cents per cubic yard, respectively, was accepted.

The dredging of a trench 40 feet wide and 5 to 6 feet deep at low tide was begun April 19 and prosecuted continuously until May 8, when the work had been completed from the end of the existing wall up to Poplar Point, a distance of about 1,800 feet. The total amount of material excavated from the trench was 10,590 cubic yards and the cost of this dredging was 13 cents per cubic yard.

One thousand six hundred and sixty-eight cubic yards of stone, removed from the piers of the old Long Bridge across the Potomac River at Washington, were deposited in the trench. This stone was delivered to the United States free of cost at the site of the bridge and was transported to Anacostia River and deposited in the trench by hired labor and use of United States and hired plant. The cost to the United States of stone thus obtained was 67 cents per cubic yard. This work was begun June 1 and was in progress at the close of the fiscal year.

Proposals for furnishing additional stone were invited May 8 and opened June 7, 1907. The lowest bid, that of Charles G. Smith & Son, at \$1.47½ per cubic yard, was accepted. Delivery of stone under contract with Charles G. Smith & Son was begun June 19, 1907, and was in progress at the close of the fiscal year, at which time 735 cubic yards had been placed in the trench.

A hydrographic survey was made of a portion of the channel preliminary to preparing specifications for dredging. These specifications were drawn up.

The total expenditure during the fiscal year was \$1,877.35, none of which was applied to maintenance. It was divided as follows: Dredging the trench and expenses incident thereto, \$1,618.29; survey of channel, \$159.75; delivering and placing stone by hired labor, \$99.31.

#### BENEFITS FROM IMPROVEMENT.

It is anticipated that this improvement will be of great benefit both to the General Government and to the city of Washington.

At the Washington Navy-Yard there has been established one of the finest gun shops in the world, and large sums have been expended in enlarging and increasing the facilities of the establishment. The improvement of the channel has rendered this navy-yard more readily accessible to a number of vessels of the Navy.

The trade and commerce of Washington are increasing, while the wharf facilities along the Potomac front are inadequate for the present traffic and afford little room for expansion. The improvement of the Anacostia will give the needed additional wharfage room and will afford abundant anchorage facilities which do not now exist in this vicinity.

The greater part of the area of the Anacostia River now consists of wide and extensive flats, which in summer and fall are covered with a dense growth of eel grass and wild rice. The large volume of sewage flowing into this stream is carried over the flats and widely disseminated at high water, and as the tide falls much of it remains lodged in the aquatic grasses, where it ferments in the intense heat of the summer and autumn. The result of this insanitary condition is the prevalence of malarial diseases in the portions of the city and District of Columbia which border the river. The reclamation of Potomac flats, although not as yet entirely completed, has largely corrected the insanitary condition along that front and gives promise of similar results on the Anacostia. Although merely incidental to the work of channel improvement, as affording the most convenient and economical means of disposing of the excavated material, this reclamation of the flats of the Anacostia below the Navy-Yard

Bridge will also render available for park or other purposes about 460 acres of desirable land.

#### ACQUISITION OF LAND.

A small amount of land which is located channelward from the established harbor lines is required for the improvement and should be acquired at an early day. This land is believed to be of but insignificant value at the present time.

#### APPROPRIATIONS.

For the successful and economical prosecution of this improvement large and continuous appropriations should be made, as was stated in presenting the original estimates for the work. Upon this assumption was based the estimated unit price for dredging, which is considerably lower than the prices which have usually been paid for such work on the Potomac, and if the appropriations are small and made at irregular intervals the actual cost of the work will exceed the estimated cost.

##### *Money statement.*

Amount appropriated by river and harbor act approved March 2, 1907	\$127,000.00
June 30, 1907, amount expended during fiscal year, for works of improvement	1,877.35
July 1, 1907, balance unexpended	125,122.65
July 1, 1907, outstanding liabilities	821.38
July 1, 1907, balance available	124,301.27
July 1, 1907, amount covered by uncompleted contracts	11,545.00
Amount (estimated) required for completion of existing project	940,061.94
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{ Amount that can be profitably expended in fiscal year ending June 30, 1908, for works of improvement, in addition to the balance unexpended July 1, 1907	150,000.00
{ Submitted in compliance with requirements of sundry civil act of June 4, 1897.	

#### APPROPRIATIONS.

Previous projects:	
September 19, 1890 (allotment from appropriation for improving Potomac River)	\$20,000
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Existing project:	
June 13, 1902	150,000
March 2, 1907	127,000
Total	277,000

#### CONTRACTS IN FORCE.

Contractor: John Miller, of Washington, D. C., for dredging a trench and for filling behind riprap wall (emergency contract).

Amount: Dredging trench, 7,000 cubic yards; filling behind riprap wall, 25,000 cubic yards.

Date of contract: April 4, 1907.

Date for commencement: April 9, 1907.

Date for completion: Seventy days after notification to commence filling behind riprap wall.

Rate: Dredging trench, 13 cents per cubic yard; filling behind riprap wall, 18 cents per cubic yard.

Contractor: Charles G. Smith & Son, of Washington, D. C., for furnishing and placing riprap stone.

Amount: 5,000 cubic yards riprap stone.

Date of contract: June 20, 1907.

Approved: June 27, 1907.

Date for commencement: Within thirty days after notification of approval.

Date for completion: Within four months after notification.

Rate: \$1.47½ per cubic yard.

### COMMERCIAL STATISTICS.

#### *Receipts and shipments by water, calendar year 1906.*

Articles.	Quantity.	Articles.	Quantity.
	<i>Tons.</i>		<i>Tons.</i>
Asphalt.....	2,061	Piles.....	3,600
Brick clay.....	84,000	Railroad ties.....	1,000
Coal.....	23,476	Sand and gravel.....	172,496
Lumber.....	1,440	Stone.....	25,140
Naval ordnance and supplies.....	40,752	Wood.....	4,500
Naphtha, oil, and gasoline.....	18,399		
Paving blocks.....	8,008	Total.....	334,867

#### *Arrivals of vessels, calendar year 1906.*

Class.	Number.	Gross tonnage.
Navy vessels drawing over 10 feet.....	35	35,000
Tugs drawing less than 10 feet.....	2,300	
Sailing vessels drawing over 15 feet.....	2	2,500
Sailing vessels drawing less than 15 feet.....	170	34,000
Barges and scows drawing less than 12 feet.....	1,800	360,000
Total.....	4,807	431,500

### K 4.

#### IMPROVEMENT OF BRETON BAY, MARYLAND.

##### WORK OF THE FISCAL YEAR ENDED JUNE 30, 1907.

Dredging under contract with Charles P. Grim was begun March 26 and completed May 14, 1907. The total amount of material dredged at Breton Bay under this contract was 25,066 cubic yards. As a result of this work there exists a channel from Leonardtown wharf to deep water in Breton Bay 150 feet wide, 10 feet deep, and 6,100 feet long, with a turning basin at its head of the same depth, 275 feet wide and about 500 feet long. The width at the turn at Buzzard Point is about 220 feet. The material dredged was removed in scows and dumped in Breton Bay at Echo Bend and near Paw Paw Point. The cost of this dredging was 19½ cents per cubic yard.

The total expenditure during the fiscal year was \$4,858.02, all of which was applied to dredging and expenses incident thereto.

*Money statement.*

July 1, 1906, balance unexpended.....	\$5,948.74
June 30, 1907, amount expended during fiscal year:	
For works of improvement .....	\$3,358.02
For maintenance of improvement.....	1,500.00
	<u>4,858.02</u>
July 1, 1907, balance unexpended.....	1,090.72
July 1, 1907, outstanding liabilities.....	523.85
	<u>566.87</u>
July 1, 1907, balance available .....	
July 1, 1907, amount covered by uncompleted contracts.....	<u>485.65</u>

## APPROPRIATIONS.

*Previous projects.*

June 18, 1878.....	\$5,000	August 5, 1886 .....	\$6,500
March 3, 1879.....	4,000	August 11, 1888 .....	3,000
June 14, 1880.....	3,000	September 19, 1890.....	5,000
March 3, 1881.....	3,000		
August 2, 1882.....	5,000	Total .....	37,500
July 5, 1884.....	3,000		

*Existing project.*

June 13, 1902 (allotted) .....	6,000
March 3, 1905.....	6,000
Total.....	<u>12,000</u>

## CONTRACT IN FORCE.

Contractor: Charles P. Grim, of Philadelphia, Pa., for dredging.

Amount: 30,000 cubic yards.

Date of contract: April 23, 1906.

Approved: April 28, 1906.

Date for commencement: June 29, 1906—extended.

Date for completion (including dredging in Mattaponi and Pamunkey rivers, and Occoquan and Carters creeks, Virginia): June 29, 1907—extended.

Rate: 19½ cents per cubic yard.

## COMMERCIAL STATISTICS.

[Furnished by Mr. Asa A. Lawrence, Leonardtown, Md.]

*Receipts and shipments by water, calendar year 1906.*

Articles.	Quantity.	Articles.	Quantity.
	<i>Tons.</i>		<i>Tons.</i>
Beef, cattle, and hogs.....	150	Iron .....	20
Bricks.....	152	Lumber .....	900
Coal.....	250	Oysters .....	1,000
Farm produce .....	900	Railroad ties .....	1,000
Flour.....	125	Tobacco .....	400
General merchandise .....	750	Wood.....	1,000
Grain.....	600		
Ice.....	50	Total .....	<u>6,597</u>

*Arrivals of vessels, calendar year 1906.*

Class.	Number.	Gross tonnage.
Steamers drawing less than 10 feet .....	370	333,000
Sailing vessels drawing 10 feet or more.....	20	1,200
Sailing vessels drawing less than 10 feet.....	40	2,000
Barges, flatboats, etc.....	10	400
Total.....	440	336,600

**K 5.****IMPROVEMENT OF YORK, MATTAPONI AND PAMUNKEY RIVERS, AND OCCOQUAN AND CARTERS CREEKS, VIRGINIA.****(A) YORK RIVER.****WORK OF THE FISCAL YEAR ENDED JUNE 30, 1907.**

As the available funds were practically exhausted prior to March 2, 1907, when the new appropriation was made, and the United States plant has been engaged on the Rappahannock River since that date, no field work was done during the year and no expenditure of funds was made.

The \$7,000 allotted to York River from the recent river and harbor appropriation is to be applied to the repair of the dike at West Point bar. The work will be started as soon as the Government plant becomes available.

*Money statement.*

July 1, 1906, balance unexpended.....	\$53.44
Amount appropriated by river and harbor act approved March 2, 1907.....	7,000.00
	<u>7,053.44</u>
July 1, 1907, balance unexpended.....	7,053.44
Amount (estimated) required for completion of existing project.....	<u>73,818.33</u>
Amount that can be profitably expended in fiscal year ending June 30, 1909, for maintenance of improvement, in addition to the balance unexpended July 1, 1907.....	37,500.00
Submitted in compliance with requirements of sundry civil act of June 4, 1897, and of section 7 of the river and harbor act of 1899.	

**APPROPRIATIONS.**

June 14, 1890.....	\$10,000.00	June 13, 1902 (emergency allotment) .....	\$5,000.000
March 3, 1881.....	25,000.00		
August 2, 1882.....	25,000.00		
July 5, 1884.....	20,000.00		246,926.98
August 5, 1886.....	18,750.00	Amount transferred to consolidated appropriation under act of June 13, 1902.....	167.03
August 11, 1888.....	30,000.00		
September 19, 1890.....	30,000.00		246,759.95
July 13, 1892.....	35,000.00	March 3, 1905 (allotted) ..	3,111.91
August 17, 1894.....	20,000.00	March 2, 1907.....	7,000.00
June 3, 1896.....	16,000.00		
March 3, 1899.....	10,000.00		
June 13, 1902 (allotted) ..	2,176.98	Total.....	256,871.86

## COMMERCIAL STATISTICS.

[Furnished by the Chesapeake Steamship Company, Baltimore, Md., and Messrs. R. E. Owens, J. W. Marshall, and others, of West Point, Va.]

*Receipts and shipments by water, calendar year 1906.*

Articles.	Quantity.	Articles.	Quantity.
	<i>Tons.</i>		<i>Tons.</i>
Farm produce .....	5,000	Railroad ties .....	5,850
General merchandise.....	43,042	Ship timber .....	2,985
Iron .....	98	Tobacco .....	16,217
Lumber.....	84,010	Wood.....	16,672
Oysters.....	22,000		
Piles .....	2,000	Total .....	197,824

*Arrivals of vessels, calendar year 1906.*

Class.	Number.	Gross Tonnage.
Steamers drawing 4 to 15 feet .....	490	245,000
Sailing vessels drawing 10 to 14 feet .....	137	75,000
Sailing vessels drawing 6 to 10 feet .....	400	40,000
Barges drawing 8 to 12 feet .....	41	30,000
Oyster boats drawing 8 to 6 feet .....	2,500	25,000
Total.....	3,568	415,000

## (B) MATTAPONI RIVER.

## WORK OF THE FISCAL YEAR ENDED JUNE 30, 1907.

Dredging at Walker bar, under contract with Charles P. Grim, was begun September 15, 1906, from which date until October 10 the dredge was engaged in excavating a channel for the deposit of dredged material. On October 18 dredging in the channel was begun, but owing partly to freshets and chiefly to the defective dredging machinery and unsatisfactory methods employed by the contractor, the progress made was extremely slow. On December 13, 1906, the dredge was libeled and removed to Aylett to await the action of the court. At the close of the fiscal year work had not been resumed on the river. The total amount of material dredged from the channel during the year was 1,873 cubic yards. As a result of this work a channel  $5\frac{1}{2}$  feet deep at low tide, 40 feet wide, and 450 feet long was dredged at the lower end of the bar, and a cut  $5\frac{1}{2}$  feet deep, 20 feet wide, and 250 feet long was dredged at the upper end. The dredged material was removed in scows and deposited in a cove just above the bar. The cost of the dredging was  $29\frac{1}{4}$  cents per cubic yard.

Specifications for dredging under funds appropriated by act of March 2, 1907, were prepared.

The total expenditure during the fiscal year was \$1,300.16, all of which was applied to dredging and expenses incident thereto.



*Money statement.*

July 1, 1906, balance unexpended .....	\$5, 755. 85
Amount appropriated by river and harbor act approved March 2, 1907 .....	6, 500. 00
	<hr/> 12, 255. 85
June 30, 1907, amount expended during fiscal year, for works of improvement .....	1, 300. 16
July 1, 1907, balance unexpended .....	10, 955. 69
	<hr/> 2, 622. 66
July 1, 1907, amount covered by uncompleted contracts .....	31, 694. 48
Amount (estimated) required for completion of existing project .....	<hr/>
Amount that can be profitably expended in fiscal year ending June 30, 1909, in addition to the balance unexpended July 1, 1907:	
For works of improvement .....	\$8, 500. 00
For maintenance of improvement .....	2, 000. 00
	<hr/> 10, 500. 00
Submitted in compliance with requirements of sundry civil act of June 4, 1897, and of section 7 of the river and harbor act of 1899.	

## APPROPRIATIONS.

June 14, 1880 .....	\$2, 500	August 18, 1894 .....	\$4, 000
March 3, 1881 .....	3, 300	June 3, 1896 .....	2, 500
July 5, 1884 .....	2, 500	June 30, 1903 (allotted) .....	800
August 5, 1886 .....	5, 000	March 3, 1905 (allotted) .....	5, 500
August 11, 1888 .....	3, 000	March 2, 1907 (allotted) .....	6, 500
September 19, 1890 .....	3, 000		
July 13, 1892 .....	4, 000	Total .....	<hr/> 42, 600

## CONTRACT IN FORCE.

Contractor: Charles P. Grim, of Philadelphia, Pa., for dredging.

Amount: 10,000 cubic yards.

Date of contract: April 23, 1906.

Approved: April 28, 1906.

Date for commencement: June 29, 1906, extended.

Date for completion (including dredging in Breton Bay, Maryland, and Pamunkey River, and Occoquan and Carters creeks, Virginia): June 29, 1907, extended.

Rate: 29½ cents per cubic yard.

## COMMERCIAL STATISTICS.

[Furnished by Mr. B. E. Owens of West Point, Va., and others.]

*Receipts and shipments by water, calendar year 1906.*

Articles.	Quantity.	Articles.	Quantity.
	<i>Tons.</i>		<i>Tons.</i>
Farm produce .....	5, 000	Ship timber .....	885
General merchandise .....	1, 900	Wood .....	10, 800
Lumber .....	56, 800		
Piles .....	2, 000	Total .....	<hr/> 79, 585
Railroad ties .....	2, 700		

*Arrivals of vessels, calendar year 1906.*

Class.	Number.	Gross tonnage.
Steamers drawing 4 to 6 feet.....	200	20,000
Sailing vessels drawing 10 to 14 feet.....	102	51,000
Sailing vessels drawing 6 to 10 feet.....	163	32,800
Barges drawing 8 to 12 feet.....	18	14,400
Total.....	483	118,000

## (C) PAMUNKEY RIVER.

## WORK OF THE FISCAL YEAR ENDED JUNE 30, 1907.

The contractor's dredge was engaged at other localities under his contract and the work of the fiscal year was limited to an examination of an obstructed thoroughfare through the marshes in the lower part of the river, and to miscellaneous office work.

The total expenditure during the fiscal year was \$99.70, of which \$77.30 was in payment of outstanding liabilities incurred in connection with snagging during the previous year, and \$22.40 was the cost of the examination mentioned. This expenditure was all for maintenance.

*Money statement.*

July 1, 1906, balance unexpended.....	\$2, 923. 83
Amount appropriated by river and harbor act approved March 2, 1907.....	5, 500. 00
	<u>8, 423. 83</u>
June 30, 1907, amount expended during fiscal year, for maintenance of improvement.....	99. 70
July 1, 1907, balance unexpended.....	<u>8, 324. 13</u>
July 1, 1907, amount covered by uncompleted contracts.....	<u>2, 340. 00</u>
Amount that can be profitably expended in fiscal year ending June 30, 1909, for maintenance of improvement, in addition to the balance unexpended July 1, 1907.....	7, 000. 00
Submitted in compliance with requirements of sundry civil act of June 4, 1897, and of section 7 of the river and harbor act of 1899.	

## APPROPRIATIONS.

June 14 1880.....	\$2, 500	August 18, 1894.....	\$2, 000
March 3, 1881.....	2, 500	June 3, 1896.....	2, 000
August 2, 1882.....	2, 500	April 28, 1903 (allotted).....	1, 000
August 5, 1886.....	5, 000	March 3, 1905 (allotted).....	3, 400
August 11, 1888.....	3, 000	March 2, 1907 (allotted).....	5, 500
September 19, 1890.....	3, 000		
July 13, 1892.....	3, 000	Total.....	<u>35, 400</u>

## CONTRACT IN FORCE.

Contractor: Charles P. Grim, of Philadelphia, Pa., for dredging.

Amount: 8,000 cubic yards.

Date of contract: April 23, 1906.

Approved: April 28, 1906.

Date of commencement: June 29, 1906—extended.

Date for completion (including dredging in Breton Bay, Maryland, and Mattaponi River and Occoquan and Carters creeks, Virginia); June 29, 1907—extended.

Rate: 29½ cents per cubic yard.

## COMMERCIAL STATISTICS.

[Furnished by Mr. B. E. Owens, West Point, Va.]

*Receipts and shipments by water, calendar year 1906.*

Articles.	Quantity.	Articles.	Quantity.
	<i>Tons.</i>		<i>Tons.</i>
Grain .....	126	Ship timber .....	2,100
Lumber .....	27,710	Wood .....	6,872
Railroad ties .....	8,150		
Salt .....	600	Total .....	89,558

*Arrivals of vessels, calendar year 1906.*

Class.	Number.	Gross tonnage.
Sailing vessels drawing over 10 feet .....	85	24,500
Sailing vessels drawing less than 10 feet .....	37	7,400
Barges drawing 6 to 10 feet .....	23	16,100
Total .....	95	48,000

## (D) OCCOQUAN CREEK.

## WORK OF THE FISCAL YEAR ENDED JUNE 30, 1907.

Dredging under contract with Charles P. Grim was begun May 29 and was in progress at the close of the fiscal year. Owing to defective plant and unsatisfactory methods employed by the contractor poor progress was made, and at the end of the year only 2,676 cubic yards of material had been dredged. As a result of this work the channel through Lower Mud bar was restored to a depth of 6 feet at low tide and a width of 90 feet for a distance of 400 feet from its lower end. The cost of this dredging was 17 cents per cubic yard.

Separate specifications for dike work and for additional dredging under funds appropriated by act of March 2, 1907, were prepared, and proposals for dike work were invited June 29.

The total expenditure during the fiscal year was \$69.01, all of which was applied to dredging and expenses incident thereto. This dredging was entirely maintenance work.

*Money statement.*

July 1, 1906, balance unexpended.....	\$5,956.59
Amount appropriated by river and harbor act approved March 2, 1907.....	20,000.00
	<hr/> 25,956.59
June 30, 1907, amount expended during fiscal year, for maintenance of improvement.....	69.01
July 1, 1907, balance unexpended.....	25,887.58
July 1, 1907, outstanding liabilities.....	172.16
	<hr/> 25,715.42
July 1, 1907, balance available.....	
July 1, 1907, amount covered by uncompleted contracts.....	5,100.00
Amount (estimated) required for completion of existing project.....	14,515.27
	<hr/> <hr/>
Amount that can be profitably expended in fiscal year ending June 30, 1909, in addition to the balance unexpended July 1, 1907:	
For works of improvement.....	\$15,450.00
For maintenance of improvement.....	1,050.00
	<hr/> 16,500.00
Submitted in compliance with requirements of sundry civil act of June 4, 1897, and of section 7 of the river and harbor act of 1899.	

## APPROPRIATIONS.

Previous projects:	
March 3, 1873.....	\$5,000.00
June 23, 1874.....	5,000.00
March 3, 1875.....	5,000.00
June 18, 1878.....	10,000.00
Total.....	<hr/> 25,000.00
Existing project:	
September 19, 1890.....	10,000.00
July 13, 1892.....	5,000.00
August 18, 1894.....	5,000.00
June 3, 1896.....	2,500.00
March 3, 1899.....	2,500.00
June 13, 1902 (allotted).....	2,600.00
March 3, 1905 (allotted).....	5,971.44
March 2, 1907 (allotted).....	20,000.00
	<hr/> 53,571.44
Amount transferred to consolidated appropriation under act of June 13, 1902.....	272.03
Total.....	<hr/> 53,299.41

## CONTRACT IN FORCE.

Contractor: Charles P. Grim, of Philadelphia, Pa., for dredging.

Amount: 30,000 cubic yards.

Date of contract: April 23, 1906.

Approved April 28, 1906.

Date for commencement: June 29, 1906—extended.

Date for completion (including dredging in Breton Bay, Maryland, and in Mattaponi and Pamunkey rivers and Carters Creek, Virginia): June 29, 1907—extended.

Rate: 17 cents per cubic yard.

## COMMERCIAL STATISTICS.

[Furnished by Mr. L. Ledman, Occoquan, Va., Mr. J. H. Bradley, Washington, D. C., and others.]

*Receipts and shipments by water, calendar year 1906.*

Articles.	Quantity.	Articles.	Quantity.
	<i>Tons.</i>		<i>Tons.</i>
Coal.....	800	Piles.....	5,000
Farm produce.....	400	Railroad ties.....	8,750
Flour.....	300	Sand.....	6,000
General merchandise.....	50	Tobacco.....	100
Grain.....	800	Wood.....	8,500
Ice.....	50		
Iron.....	100	Total.....	28,800
Lumber.....	950		

*Arrivals of vessels, calendar year 1906.*

Class.	Number.	Gross tonnage.
Steam vessels drawing less than 7 feet.....	250	87,500
Sailing vessels drawing less than 7 feet.....	100	10,000
Barges, flatboats, etc.....	300	75,000
Total.....	650	122,500

## (E) CARTERS CREEK.

## WORK OF THE FISCAL YEAR ENDED JUNE 30, 1907.

Dredging in the channel at Gallyhook Point under contract with Charles P. Grim was begun October 17 and completed November 13, 1906. Five thousand one hundred and ninety-one cubic yards of material were dredged at this locality, completing the straight channel 100 feet wide and 12 feet deep at low tide, called for in the project.

The dredge was then taken to the bar at the mouth of the creek, where dredging was begun November 17 and completed December 22, 1906. Seven thousand two hundred and eighty-two cubic yards of material were excavated from the bar at the end of Crab Point, which was dredged to a depth of 15 feet at low tide for a length of 400 feet and a maximum width of 100 feet.

The material excavated at both localities was removed in scows and dumped in deep water in the Rappahannock River. The cost of the dredging was 26 $\frac{1}{4}$  cents per cubic yard at each locality.

An examination of the channels was made in June, 1907.

Specifications for dredging under funds appropriated by act of March 2, 1907, were prepared.

The total expenditure during the fiscal year was \$4,217.33, which was all applied to dredging and expenses incident thereto.

*Money statement.*

July 1, 1906, balance unexpended.....	\$4,610.56
Amount appropriated by river and harbor act approved March 2, 1907.....	10,000.00
	<hr/> 14,610.56
June 30, 1907, amount expended during fiscal year, for works of improvement.....	4,217.33
	<hr/> 10,393.23
July 1, 1907, balance unexpended.....	10,393.23
July 1, 1907, outstanding liabilities.....	62.91
	<hr/> 10,330.32
July 1, 1907, balance available.....	10,330.32
	<hr/>
July 1, 1907, amount covered by uncompleted contracts.....	335.22
Amount (estimated) required for completion of existing project.....	6,111.52

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APPROPRIATIONS.

June 13, 1902 (allotted).....	\$10,471.83
March 8, 1905 (allotted).....	9,116.65
March 2, 1907 (allotted).....	10,000.00
	<hr/>
Total .....	29,588.48

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CONTRACT IN FORCE.

Contractor: Charles P. Grim, of Philadelphia, Pa., for dredging.

Amount: 17,000 cubic yards.

Date of contract: April 23, 1906.

Approved: April 28, 1906.

Date for commencement: June 29, 1906—extended.

Date for completion (including dredging in Breton Bay, Maryland, and Mattaponi and Pamunkey rivers and Occoquan Creek, Virginia): June 29, 1907—extended.

Rate: 26½ cents per cubic yard.

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COMMERCIAL STATISTICS.

[Furnished by Messrs. H. E. Owen and W. A. Dameron, of Weems, Va., and Mr. F. A. Gumby, of Irvington, Va.]

*Receipts and shipments by water, calendar year 1906.*

Articles.	Quantity	Articles.	Quantity.
	<i>Tons.</i>		<i>Tons.</i>
Bricks.....	1,000	Guano.....	2,800
Canned goods.....	800	Ice.....	660
Coal.....	6,000	Lumber.....	7,500
Crabs.....	150	Oysters.....	8,350
Farm produce.....	500	Wood.....	1,200
Fish for guano.....	15,000	General merchandise.....	900
Oil (fish).....	1,700		
Grain.....	190	Total.....	46,240

*Arrivals of vessels, calendar year 1906.*

Class.	Number.	Gross tonnage.
Steamers drawing 6 to 10 feet.....	700	205,000
Steam and gasoline boats drawing less than 6 feet.....	8,000	15,000
Sailing vessels drawing 8 to 12 feet.....	45	9,000
Sailing vessels drawing less than 8 feet.....	6,000	60,000
Total.....	9,745	299,000

## K 6.

## IMPROVEMENT OF NOMINI CREEK, VIRGINIA.

## WORK OF THE FISCAL YEAR ENDED JUNE 30, 1907.

About 1,200 willow cuttings were planted in the sand at White Point with a view to determining the practicability of protecting by this method the sand against wave and wind action. Some sweet clover seed, furnished by the Department of Agriculture, was sowed on White Point for the same purpose.

Specifications for dike work under funds appropriated by the act of March 2, 1907, were prepared and proposals were invited June 29, 1907.

The total expenditure during the fiscal year was \$45.33, which was all applied to maintenance in protecting the sand at White Point against erosion.

*Money statement.*

Amount appropriated by river and harbor act approved March 2, 1907.....	\$5,000.00
June 30, 1907, amount expended during fiscal year, for maintenance of improvement.....	45.33
July 1, 1907, balance unexpended.....	4,954.67
July 1, 1907, outstanding liabilities.....	5.14
July 1, 1907, balance available.....	4,949.53
Amount (estimated) required for completion of existing project.....	30,008.71
Amount that can be profitably expended in fiscal year ending June 30, 1909, in addition to the balance unexpended July 1, 1907:	
For works of improvement.....	\$11,000.00
For maintenance of improvement.....	5,000.00
	16,000.00
Submitted in compliance with requirements of sundry civil act of June 4, 1897, and of section 7 of the river and harbor act of 1890.	

## APPROPRIATIONS.

March 3, 1873.....	\$10,000	July 13, 1892.....	\$10,000
June 23, 1874.....	6,000	August 18, 1894.....	5,000
March 3, 1875.....	5,000	June 3, 1896.....	2,500
March 5, 1879.....	2,500	March 3, 1899.....	10,000
June 14, 1880.....	5,000	March 3, 1905.....	4,000
March 3, 1881.....	2,000	March 2, 1907.....	5,000
August 2, 1882.....	2,000		
August 11, 1888.....	5,000	Total.....	79,000
September 19, 1890.....	5,000		

## COMMERCIAL STATISTICS.

[Furnished by Mr. J. L. Healy, Templeman Crossroads, Va.]

*Receipts and shipments by water, calendar year 1906.*

Articles.	Quantity.	Articles.	Quantity.
	<i>Tons.</i>		<i>Tons.</i>
Coal .....	10	Lumber .....	3,100
Farm produce .....	5,000	Oysters .....	500
Fertilizer .....	1,000	Railroad ties .....	1,000
Flour .....	100	Tobacco .....	5
Grain .....	1,000	Wood .....	3,000
General merchandise .....	9,000	Total .....	23,780
Ice .....	10		
Iron .....	5		

*Arrivals of vessels, calendar year 1906.*

Class.	Number.	Gross tonnage.
Steamers drawing less than 10 feet .....	160	76,000
Sailing vessels drawing less than 10 feet .....	150	12,000
Barges .....	1	400
Total .....	311	88,400

During the year a coaling station was established in Nomini Creek for the Virginia oyster police boat.

## K 7.

## IMPROVEMENT OF RAPPAHANNOCK RIVER, VIRGINIA.

WORK OF THE FISCAL YEAR ENDED JUNE 30, 1907.

Owing to the failure of the contractor to furnish piles and lumber within the specified time, the United States plant was idle until August 13, 1906, when work was begun on repairing old dikes with some materials on hand. Dike No. 3 at Pratts bar, Dike No. 6½ at Spottswood bar, and Dikes No. 1 and 3 at Castle Ferry bar were thus repaired during August.

On August 25 the delivery of piles and lumber under contract was commenced and the driving of piles for the new dikes was begun at Pratts bar August 31. This work was prosecuted continuously from that time until the close of the year, except when delayed by freshets, ice in the river, or repairs to the plant. During the year there were constructed 764 linear feet of dike at Pratts bar, 719 linear feet at Bernards bar, 915 linear feet at Spottswood bar, 620 linear feet at Castle Ferry bar, and 602 linear feet at Snowden bar. These dikes were built by hired labor and use of the United States plant at an average cost of \$2.95 per linear foot, exclusive of office and other contingent expenses.

The lumber and piles for the dike were furnished under contract with Duke & Smith, of Norfolk, Va. The contractor was very slow in the delivery of material, which not only retarded the beginning



of the work but rendered it necessary to purchase large quantities of lumber in open market in order that the operations might not be interrupted. The total amount of material furnished under this contract and open-market purchases, authorized by it, was 20,733 linear feet of piles and 233,690 feet board measure of lumber.

Dredging under contract with Ernest L. Miner was begun March 1, 1907, at Pratts bar and was prosecuted continuously to the close of the fiscal year, except when delayed by freshets, ice, or repairs incident to work of this character. At the close of the fiscal year a channel 10 feet deep at low tide and 75 feet wide had been dredged through Pratts bar, a channel 10 feet deep and 100 feet wide had been dredged through Bernards bar, a channel 10 feet deep and 70 feet wide had been dredged through Spottswood bar, the channel at the lower end of Fredericksburg bar had been widened and straightened, the turning basin at Fredericksburg had been dredged to a depth of 10 feet, and work was in progress at Castle Ferry bar, where a channel 10 feet deep, 80 feet wide, and 950 feet long had been dredged. The total amount of material excavated under this contract was 47,422 cubic yards, of which 13,410 cubic yards were dredged at Pratts bar, 7,309 cubic yards at Bernards bar, 10,544 cubic yards at Spottswood bar, 11,854 cubic yards at Fredericksburg bar, and 4,305 cubic yards at Castle Ferry bar. In addition to this dredging 4 logs were removed from the channels. The material was deposited behind the dikes at the respective bars by the hydraulic process. The cost of the dredging was 24½ cents per cubic yard.

One snag was removed from the channel at Spottswood bar by hired labor.

Considerable work was done by hired labor toward protecting by means of wattlings and the planting of willow slips the recently formed sand fills against erosion by freshets.

The United States snag boat was injured in running through the ice, and was repaired and painted.

Proposals for furnishing additional lumber and piles for dike construction were invited May 31 and opened June 29. Award of contract has not yet been made.

Under date of April 15, 1907, proposals were invited for furnishing and delivering a floating pile driver and scow, either new or second hand, at Fredericksburg. On June 21, 1907, authority was granted to purchase a pile driver and scow at a cost not to exceed \$2,250 and \$400, respectively.

There were several slight and three comparatively high freshets during the year. One freshet reached a maximum height of 19.6 feet above low tide at Fredericksburg on October 21, 1906; on April 9, 1907, another freshet reached a height of 15.4 feet above the same datum, and on June 3, 1907, a height of 17.5 feet was reached. The river was frozen over seven days in January and fourteen days in February. The freshets and ice retarded the work considerably and added to its cost.

The total expenditure during the fiscal year was \$22,436.84, which was applied to the various items of work approximately as follows: Constructing new dikes, \$11,638.63; repairing old dikes, \$1,638.60; dredging new channels, \$3,768.20; redredging, \$5,100; removing snag, \$5; protecting the filled areas, \$247.21; investigation of pile drivers, \$44.20.

## MAINTENANCE OF IMPROVEMENT.

At the time the last modified project was submitted it was estimated that the annual cost of maintenance would be \$10,000. The greater part of this expenditure will be required at Fredericksburg bar, which, being near the head of tide water, receives new deposits of sand with each recurring freshet to such an extent that dredging is necessary almost every year to maintain the channel in navigable condition. The cost of removing these deposits at this bar alone is estimated at \$7,500 per annum.

*Money statement.*

July 1, 1906, balance unexpended.....	\$31, 182. 29
Amount appropriated by river and harbor act approved March 2, 1907.....	77, 729. 00
Amount received from sale of condemned property.....	110. 00
Amount received from judgment recovered.....	1, 000. 00
	<hr/> 110, 021. 29
June 30, 1907, amount expended during fiscal year:	
For works of improvement.....	\$15, 446. 03
For maintenance of improvement.....	6, 990. 81
	<hr/> 22, 436. 84
July 1, 1907, balance unexpended.....	87, 584. 45
July 1, 1907, outstanding liabilities.....	3, 953. 07
	<hr/> 83, 631. 38
July 1, 1907, balance available.....	
July 1, 1907, amount covered by uncompleted contracts.....	3, 706. 48
Amount (estimated) required for completion of existing project.....	<hr/> 90, 000. 00
Amount that can be profitably expended in fiscal year ending June 30, 1909, in addition to the balance unexpended July 1, 1907:	
For works of improvement.....	\$75, 000. 00
For maintenance of improvement.....	45, 000. 00
	<hr/> 120, 000. 00
Submitted in compliance with requirements of sundry civil act of June 4, 1897, and of section 7 of the river and harbor act of 1890.	

## APPROPRIATIONS.

March 3, 1871.....	\$15, 000	July 13, 1892.....	\$20, 000
June 10, 1872.....	15, 000	August 18, 1894.....	10, 000
March 3, 1873.....	15, 000	June 3, 1896.....	8, 000
June 23, 1874.....	7, 000	March 3, 1899.....	15, 000
March 3, 1875.....	5, 000	June 13, 1902.....	25, 000
August 14, 1876.....	10, 000	April 28, 1904 (allotted).....	25, 000
June 18, 1878.....	13, 500	March 3, 1905.....	40, 000
March 3, 1879.....	10, 000	March 2, 1907.....	77, 729
June 14, 1880.....	25, 000		
March 3, 1881.....	15, 000	Total.....	<hr/> 435, 229
August 2, 1882.....	17, 000		
July 5, 1884.....	20, 000	Damage recovered from contractors' sureties.....	1, 000
August 5, 1886.....	20, 000	Proceeds of sale of property.....	110
August 11, 1888 (\$15,000, of which \$3,000 was for Urbana).....	12, 000		
September 19, 1890.....	15, 000	Total.....	<hr/> 1, 110

\* Plus \$10,000 per annum for maintenance.

## CONTRACTS IN FORCE.

Contractor: Ernest L. Miner, of Petersburg, Va., for dredging.

Amount: 45,000 cubic yards.

Date of contract: May 23, 1906.

Approved: June 5, 1906.

Date for commencement: Thirty days after notification.

Date for completion: Six months after commencement.

Rate: 24½ cents per cubic yard.

Contractor: Duke & Smith (Incorporated), of Norfolk, Va., for lumber and piles (emergency contract).

Amount: 213,000 feet B. M. Virginia pine lumber; 17,680 linear feet pine piles.

Date of contract: April 18, 1906.

Date for commencement and completion: First lot of piles and lumber to be delivered within thirty days and subsequent lots within fifteen days after receipt of orders:—extended.

Rate: Lumber, \$18 per M. feet B. M.; piles, at 7 cents per linear foot.

## COMMERCIAL STATISTICS.

[Furnished by Mr. E. W. Mills, chairman city council, Fredericksburg, Va., and Mr. A. P. Rowe, chairman Business Men's Association, Fredericksburg, Va.]

*Receipts and shipments by water, calendar year 1906.*

Articles.	Quantity.	Articles.	Quantity.
	<i>Tons.</i>		<i>Tons.</i>
Apples.....	100	Ice .....	1,560
Bricks .....	2,000	Lumber .....	98,345
Canned goods.....	1,975	Manufactures.....	2,810
Cattle.....	3,340	Oysters.....	2,250
Coal.....	3,650	Pickles.....	2,500
Farm produce.....	81,382	Railroad ties.....	109,650
Fertilizers.....	19,730	Sumac.....	800
Fish.....	1,300	Tobacco.....	100
Flour.....	6,375	Wood.....	24,903
General merchandise.....	27,420		
Grain.....	23,271	Total.....	363,911
Hay and straw.....	950		

*Arrivals of vessels, calendar year 1906.*

Class.	Number.	Gross tonnage.
Steamers drawing 8 to 11 feet.....	250	125,000
Sailing vessels drawing 8 to 11 feet.....	1,095	320,000
Barges, flat boats, etc.....	150	150,000
Total.....	1,495	595,000

## K 8.

## IMPROVEMENT OF URBANA CREEK, VIRGINIA.

## WORK OF THE FISCAL YEAR ENDED JUNE 30, 1907.

Separate specifications were prepared for jetty work and for dredging, and proposals for jetty work were invited June 29.

In the Donaldson-Shultz case brought by the United States to compel the removal of a dock projecting into the channel, the circuit

court of appeals on November 8 handed down an opinion reversing the decree of the circuit court and opening the case to retrial. On March 20 the Donaldson-Shultz Company applied for a permit to reconstruct their wharf at Urbana along lines suggested by the Engineer Office. On April 2 this permit was granted by the Secretary of War, and on April 25 the lines of the wharf were laid out.

The reconstruction of this wharf was commenced June 28 and was in progress at the end of the fiscal year.

The total expenditure during the fiscal year was \$5.75, which was incurred in connection with the modification of the Donaldson-Shultz wharf and is regarded as a maintenance expenditure.

#### Money statement.

July 1, 1906, balance unexpended.....	\$9,899. 19
June 30, 1907, amount expended during fiscal year, for maintenance of improvement.....	5. 75
July 1, 1907, balance unexpended.....	9,893. 44
July 1, 1907, outstanding liabilities.....	15. 81
July 1, 1907, balance available.....	9,877. 63
Amount (estimated) required for completion of existing project.....	32,350. 65
Amount that can be profitably expended in fiscal year ending June 30, 1909, in addition to the balance unexpended July 1, 1907:	
For works of improvement.....	\$13,000. 00
For maintenance of improvement.....	3,500. 00
	16,500. 00
Submitted in compliance with requirements of sundry civil act of June 4, 1897, and of section 7 of the river and harbor act of 1899.	

#### APPROPRIATIONS.

March 3, 1879.....	\$5,000	July 13, 1892.....	\$3,000
June 14, 1880.....	2,500	August 18, 1894.....	3,000
March 3, 1881.....	4,000	June 3, 1896.....	3,000
August 2, 1882.....	4,000	March 3, 1899.....	3,000
August 11, 1888 (Included in an appropriation of \$15,000 for Rappahannock River).....	3,000	March 3, 1905.....	10,000
September 19, 1890.....	3,000	Total.....	43,500

#### COMMERCIAL STATISTICS.

[Furnished by Messrs. George V. Wagener, H. J. Hayden, C. S. Burton, and J. D. Gressett, of Urbana, Va.]

#### Receipts and shipments by water, calendar year 1906.

Articles.	Quantity.	Articles.	Quantity.
	Tons.		Tons.
Bricks.....	975	Lumber.....	12,480
Canned goods.....	1,050	Oysters.....	8,710
Coal.....	1,500	Oil and gasoline.....	230
Excelsior.....	2,000	Overalls and shirts.....	275
Farm produce.....	1,500	Pickles.....	750
Fertilizer.....	400	Railroad ties.....	1,000
General merchandise.....	3,960	Wood.....	3,450
Ice.....	1,825	Total.....	35,185
Lime and cement.....	80		

*Arrivals of vessels, calendar year 1906.*

Class.	Number.	Gross tonnage.
Steamers drawing less than 9 feet.....	400	70,000
Sailing vessels drawing over 7 feet.....	164	24,600
Sail boats drawing less than 7 feet.....	2,500	12,500
Total.....	3,064	107,100

## K 9.

## IMPROVEMENT OF HARBOR AT MILFORD HAVEN, VIRGINIA.

## WORK OF THE FISCAL YEAR ENDED JUNE 30, 1907.

The work of the fiscal year was limited to an inspection of the locality and to miscellaneous office work, for which the total expenditure was \$20.

Specifications for constructing the jetty at Narrows Point were prepared and proposals were invited June 29, 1907.

*Money statement.*

July 1, 1906, balance unexpended.....	\$2,578.84
June 30, 1907, amount expended during fiscal year, for works of improvement.....	20.00
July 1, 1907, balance unexpended.....	2,558.84
July 1, 1907, outstanding liabilities.....	48.62
July 1, 1907, balance available.....	2,510.22

## APPROPRIATIONS.

March 3, 1899.....	\$12,500.00
June 13, 1902.....	5,000.00
	17,500.00
Amount of judgment recovered.....	3,032.97
Total.....	20,532.97

## COMMERCIAL STATISTICS.

[Furnished by the Baltimore, Chesapeake and Atlantic Railway Company, Baltimore, Md., and Mr. Eugene Callis, Callis Wharf, Va.]

*Receipts and shipments by water, calendar year 1906.*

Articles.	Quantity.	Articles.	Quantity.
	<i>Tons.</i>		<i>Tons.</i>
Brick, cement, and lime.....	300	Ice.....	200
Coal.....	150	Iron.....	40
Farm produce.....	788	Live stock.....	65
Fertilizers.....	600	Lumber.....	300
Fish and crabs.....	3,100	Oysters.....	6,000
Flour.....	250	Piles.....	500
Gasoline.....	80	Tobacco.....	20
General merchandise.....	1,630		
Grain.....	160	Total.....	14,728
Hay and feed stuff.....	500		

*Arrivals of vessels, calendar year 1906.*

Class.	Number.	Gross tonnage.
Steamers drawing 10 feet or more .....	4	2,000
Steamers drawing less than 10 feet .....	200	132,000
Sailing vessels drawing less than 10 feet .....	100	25,000
Barges, flat boats, launches, etc .....	18,000	36,000
Total .....	18,304	195,000

## K 10.

## IMPROVEMENT OF JAMES RIVER, VIRGINIA.

## WORK OF THE FISCAL YEAR ENDED JUNE 30, 1907.

Operations were carried on under two contracts, one with J. Clements Shafer, approved March 4, 1903, and the other with P. Sanford Ross (Incorporated), approved February 12, 1906.

The work accomplished toward obtaining increased width of channel during the fiscal year consisted in enlarging about 10,440 linear feet of channel, having a depth of 18 feet at mean low water, as follows: Widening to 125 feet about 1,600 feet of the channel above the lower city line of Richmond, which had been excavated during the preceding fiscal year to a width of 75 feet; widening about 800 feet of channel immediately below the city line from 100 feet to 150 feet; widening to 140 feet a reach about 2,600 feet long beginning 1,800 feet below the city line; widening about 3,900 feet following and below the last-named reach from 100 to 150 feet; widening to 150 feet 140 feet of channel immediately below the 3,900-foot reach above mentioned; and widening about 1,400 feet of channel near the lower end of Warwick reach,  $4\frac{1}{2}$  miles below Richmond, from about 150 feet to about 300 feet. The work done in obtaining increased depth of channel consisted in deepening the channel on Kingsland (or Graveyard) reach about 1,200 feet long, from 16.1 feet to 17 feet. The improvement on Warwick reach was effected through contraction by regulation works, and on Kingsland reach by building up old jetties with material, principally rock, excavated from the channel.

Of the expenditures for the past fiscal year \$99,170.21 was for works of improvement and \$4,757 for maintenance.

## WORK UNDER CONTRACT WITH J. CLEMENTS SHAFER.

Operations comprised enlarging the channel by blasting and dredging and by building up four of the jetties in Kingsland reach and reinforcing the revetments of ten of the jetties on Varina reach.

Dredging was carried on over a reach about 6,660 feet long, beginning about 1,800 feet below the lower city line of Richmond and embracing parts of sections 2 and 4 and all of section 3. The greater part of the work consisted in finishing portions of the channel in which most of the excavation had been done prior to the present fiscal year by removing areas still remaining above the proposed level of its bottom. This work, from its nature, was slow and the volume of material excavated small, as compared with the period of working.

The plant employed consisted of a dredge arranged for using either a clam shell or a scoop bucket, a drill scow for blasting, equipped with a sweep for locating high areas requiring dredging and a complement of deck and dump scows. A steam hoister was also employed for transferring from scows to dump cars excavated material which was deposited on the low ground behind the dike in Warwick reach.

The time lost from various causes was as follows: Freshets, twenty-four days; changing buckets and repairing machinery, twenty-four days, and waiting for scows to be unloaded, eight days.

Subjoined are the quantities of work done:

Material excavated from channel: 23,933.13 cubic yards earth; 2,180.16 cubic yards soft rock, and 3,477.35 cubic yards hard rock. Excavated material conveyed from scows to points of deposit, 24,317.40 cubic yards. Excavated material transported on deck scows below jetty 134, 4,732.80 cubic yards. Excavated material transported on dump scows to vicinity of Jordans Point, 870.95 cubic yards.

The expenditures during the fiscal year on account of the several classes of work were as follows: Earth excavation, \$7,504.27; soft rock excavation, \$683.59; hard rock excavation, \$19,460.13; conveying excavated material from scows to points of deposit, \$4,357; transporting excavated material on deck scows below jetty 134, \$503.50; transporting excavated material on dump scows to vicinity of Jordans Point, \$175.56.

The cost to the United States of work done under this contract during the fiscal year was: Earth excavation, 31.35 cents per cubic yard; soft rock excavation, 31.35 cents per cubic yard; hard rock excavation, \$5.5962 per cubic yard; conveying excavated material from scows to point of deposit, 17.92 cents per cubic yard; transporting excavated material on deck scows below jetty 134, 10.64 cents per cubic yard; and transporting excavated material on dump scows to vicinity of Jordans Point, 20.16 cents per cubic yard.

The expenditure chargeable to maintenance was \$4,535.

Following is a description in detail of the work:

*Section 2.*—The work of finishing the portion of the channel to be made 140 feet wide by 18 feet deep, of which 1,030 linear feet had been completed during the previous fiscal year, was proceeded with till July 11, when it was temporarily suspended in order that the dredge might be moved to section 3 to procure hard rock required for raising the jetties in Kingsland reach. The work was resumed October 15, and the section completed December 28, 1906. The length of channel completed during the year was 2,620 feet. The material excavated consisted of 4,960 cubic yards of earth, 826 cubic yards of soft rock, and 261 cubic yards of hard rock.

*Section 3.*—The work accomplished comprised dredging hard rock on Goode Rocks reef in the lower part of the section and finishing the channel for a width of 150 feet and a depth of 18 feet over the entire section 3,900 feet long. Rock dredging was carried on between July 17 and October 15, and finishing the channel between January 2 and June 25, 1907, when the work in the section was completed.

A small amount of reblasting was found necessary in this section.

The following quantities of material were excavated and disposed of: Earth, 17,907.2 cubic yards; soft rock, 1,353.7 cubic yards; hard rock, 3,216.39 cubic yards.

*Section 4.*—The proposed work involves the dredging of the outer edge of a convex bar for a distance of about 1,125 feet, to restore the former channel width of 150 feet, which had been reduced to upward of 100 feet by the extension of the bar. About one-fourth of the area requiring excavation was dredged and 140 linear feet of channel completed. The material excavated and disposed of consisted of 1,065.74 cubic yards of earth.

*Kingsland reach.*—In June, 1906, the channel on this reach was found to have shoaled so that the ruling depth was only 16.1 feet. Between July, 1906, and March, 1907, the four jetties on the right bank and parts of the longitudinal dike near their river ends were built up with rock. As a result of this contraction the channel was deepened about 1 foot by scour.

#### WORK UNDER CONTRACT WITH P. SANFORD ROSS (INCORPORATED).

At the beginning of the fiscal year about 1 per cent of the work under contract with P. Sanford Ross (Incorporated), had been done. During the fiscal year about 40 per cent was completed. The work carried on comprised channel enlargement and jetty construction and repairs.

The work done in channel enlargement included widening to 150 feet the channel on Rocketts reef at the head of section 2, which in 1901 had been given a width of 100 feet; widening to 125 feet about 1,600 feet of channel in section 1, between Rocketts reef and the proposed turning basin in Richmond Harbor, excavated in 1905 and 1906 to a width of 75 feet; nearly completing to the same dimensions about 500 feet of channel immediately above the completed part; performing the initial dredging and blasting and a considerable portion of the second dredging for the upper 400 feet of channel to be widened adjacent to the proposed turning basin; and widening the channel on Warwick reach from about 150 feet to about 300 feet for a distance of some 1,400 feet by means of regulation works. This last item is an extension of the channel enlarged by regulation works constructed in 1903. In all the above cases the channel was made 18 feet deep at low water.

Jetty work comprised constructing eleven jetties at Goode Rocks in section 4, two jetties on Warwick reach in section 5, and extending three and repairing two old jetties in the latter section.

The plant employed consisted of a dredge used with either a scoop or a clam-shell bucket, a complement of deck scows and dump scows, a steam drill mounted on a scow, and the same steam hoister and dump cars as used under the Shafer contract. A floating pile driver, a small land driver, and a deck scow were used in conducting jetty construction and repairs.

The time lost by the dredge from various causes was as follows: Freshets, twenty-one days; changing buckets and repairing machinery, nineteen days, and waiting for scows to be unloaded, thirty-three days.

Following are the quantities of different classes of work performed: Material excavated from channel, 40,130.71 cubic yards earth, 6,694.59 cubic yards hard rock; excavated material conveyed from scows to points of deposit, 20,600.24 cubic yards; excavated material trans-



ported on deck scows below jetty 134, 1,083.88 cubic yards; excavated material transported on dump scows to vicinity of Jordans Point, 19,839.5 cubic yards. Materials placed in jetties: Pine piles, 3,831.5 linear feet; oak piles, 493 linear feet; white oak wales and strings, 13,836.2 feet B. M.; pine sheet piling, 62,018.4 feet B. M.

The expenditures during the year on account of the several classes of work were as follows: Earth excavation, \$13,040.25; hard-rock excavation, \$46,671.53; conveying excavated material from scows to points of deposit, \$4,381.48; transporting excavated material on deck scows below jetty 134, \$128.08; transporting excavated material on dump scows to vicinity of Jordans Point, \$4,102.46; pine piles, in place, \$1,584.58; oak piles, in place, \$291.27; white oak wales and strings, in place, \$817.44; pine sheet piling, in place, \$2,858.

The cost to the United States of work done under this contract during the fiscal year was as follows: Earth excavation, 32.49 cents per cubic yard; hard-rock excavation, \$6.9715 per cubic yard; conveying excavated material from scows to points of deposit, 21.27 cents per cubic yard; transporting excavated material on deck scows below Jetty 134, 11.82 cents per cubic yard; transporting excavated material on dump scows to vicinity of Jordans Point, 20.68 cents per cubic yard; pine piles, in place, 41.35 cents per linear foot; oak piles, in place, 59.08 cents per linear foot; white oak wales and strings, in place, \$59.08 per M feet B. M.; pine sheet piling, in place, \$46.0831 per M feet B. M.

The expenditure chargeable to maintenance was \$222.

Following is a description of the work in detail:

*Section 1.*—The proposed work under this contract includes enlarging the channel for a distance of 2,100 feet upstream from the lower city line of Richmond by increasing its width from 75 feet to 125 feet, widening the next 400 feet above from 75 feet to 200 feet, and excavating to the same depth of 18 feet below low water an area 400 feet long by 100 feet wide adjoining the last-named part of the channel and forming part of the proposed turning basin.

The initial dredging of the part of the section between the lower city line and the proposed turning basin was begun July 2, 1906, and drilling, blasting, and dredging of this area were carried on intermittently until March 31, when the lower 1,600 feet of the section were completed. The dredging, drilling, and blasting of the part of the channel to be excavated adjoining the proposed turning basin was carried on between April 2 and June 11, when it was completed for a width of about 75 feet.

Following are the quantities of material excavated from the channel in section 1: Earth, 34,233.34 cubic yards; hard rock, 1,938.17 cubic yards.

*Section 2.*—The improvement provided for under the contract involves widening the 100 by 18-foot channel on Rocketts reef for a distance of about 800 feet.

The initial drilling and blasting, which was begun April 19, 1906, was carried on continuously and completed August 4. Dredging blasted rock was begun August 6 and completed November 21. The second blasting, for removing high areas not broken up by the first blasting or removed by the first dredging, was begun November 26 and completed December 28.

The second dredging was begun December 20 and completed January 14, 1907. The finishing occupied from January 22 to February 26. Parts of this channel were excavated to greater depths than called for in the contract, for which over-depth deductions were made.

Following are the quantities excavated from the channel to the depth and width prescribed: Earth, 5,897.37 cubic yards; rock, 4,756.42 cubic yards.

*Jetty construction and repairs.*—Work on the Warwick jetties was begun August 10. The timber work was nearly completed October 5, when a freshet occurred, during which parts of two jetties under construction, which had not been revetted by the contractor, were washed away. A second freshet on October 22 caused similar losses of unrevetted work. The jetties were completed November 8. They form an extension downstream of the regulation works on Warwick reach and have produced the channel enlargement for which they were designed.

Repairs to jetties were made between November 8 and 14.

The construction of the eleven jetties at Goode Rocks was begun November 17, 1906, and completed February 20, 1907. Their purpose is to stop the widening of the channel by bank erosion above low water and prevent bar growth on the opposite side of the channel.

#### GENERAL.

Cross sections were sounded in November over the 5-mile reach of river immediately below the Richmond city line and over Kingsland reach, in both of which the jetties had been extended and raised, to observe the effect of the October freshets on the channel. The soundings showed favorable changes and indicate that channel enlargement would result from a slight further contraction, also that, for maintaining parts of the channel that have been enlarged by dredging, further development of the regulation works is required.

Surveys of the following ten shoals between the Appomattox River and the mouth of the James were made between January 14 and March 20: Appomattox, City Point, Jordans Point, Harrisons Bar, Windmill Point, Dancing Point, Swans Point, Goose Hill Flats, Tribell shoal, and Rocklanding shoal. The surveys show that within the past twenty-seven to thirty-six years more or less building up of all of the shoals has taken place in consequence of deposits of silt. The depth of this deposit varies generally from one-half foot to 4 feet, and is greatest on a part of Rocklanding shoal, about 89 miles below Richmond, where it is 11 feet. These conclusions must, however, be accepted with some caution, as differences in the datum planes used and in the methods of sounding make accurate comparisons difficult between charts of surveys made many years apart.

The ruling depth has diminished on six of the shoals from about one-half foot to about 3 feet. At Appomattox shoal, 32 miles below Richmond, it is still 22 feet, as in 1880; at City Point shoal, 34 miles below Richmond, the channel has deepened since 1875 from 18½ to 20¼ feet; at Jordans Point shoal, 36 miles below Richmond, it has increased 3 feet in depth since 1875, or to 22 feet, and at Windmill Point shoal, 42 miles below Richmond, the depth is now 20¼ feet, instead of 20 feet as in 1875.

On the shoals improved by dredging the depths in parts of the channel on Goose Hill flats, 70 miles below Richmond, have decreased since 1895 from about one-half foot to about 2 feet, and on Swans Point shoal, 65 miles below Richmond, since 1881 about the same amount. On Harrison's bar, 38 miles lower down, the greater part of the lower two-thirds of the dredged channel is of the same depth as in 1895, or deeper, while other parts of the channel toward its upper end have filled to about the same extent, but for a less area. An 18-foot depth obtains in the above channels, although the width for this depth is reduced for short distances to about 100 feet.

A number of repairs were made to the steamer *Chipeta*, belonging to this work. The boat's boiler was inspected June 12 by the United States inspectors of steam vessels. A scow with quarters was repaired and put in condition for the use of the party employed in making surveys of the shoals below the Appomattox. Braces were subsequently added to the boat to put it in condition for transfer to the Rappahannock River.

With a view to reducing the cost of future improvements by saving to the Government inspectors' wages and contractors' profits, and to insure having an efficient plant for carrying on work expeditiously, it is considered desirable for the Government to own its own plant, and to carry on the work by day labor instead of by contract as has been done heretofore. The cost of the work, if appropriations are made with the same regularity as in the past few years, would probably be from 10 to 25 per cent less than by contract. The estimated cost of a plant, comprising a dredge, steam tug, and a complement of scows with an average daily capacity of excavating 1,200 cubic yards of earth, is \$98,000. The cost of a plant for excavating mixed materials and constructing jetties in the upper reaches of the river would be about \$130,000. The estimated annual expenditures in carrying on work with these two plants is \$80,000 to \$100,000.

#### *Money statement.*

July 1, 1906, balance unexpended.....	\$272, 106. 30
Amount appropriated by river and harbor act approved March 2, 1907.....	200, 000. 00
Amount received from sale of blueprints.....	. 67
	472, 106. 97
June 30, 1907, amount expended during fiscal year:	
For works of improvement.....	\$99, 170. 21
For maintenance of improvement.....	4, 757. 00
	103, 927. 21
July 1, 1907, balance unexpended.....	368, 179. 76
July 1, 1907, outstanding liabilities.....	1, 523. 81
	366, 655. 95
July 1, 1907, balance available.....	366, 655. 95
July 1, 1907, amount covered by uncompleted contracts.....	156, 387. 18
Amount (estimated) required for completion of existing project.....	3, 529, 868. 32
<hr/>	
Amount that can be profitably expended in fiscal year ending June 30, 1909, in addition to the balance unexpended July 1, 1907:	
For works of improvement.....	\$370, 000. 00
For maintenance of improvement.....	30, 000. 00
	400, 000. 00
<hr/>	
Submitted in compliance with requirements of sundry civil act of June 4, 1897, and of section 7 of the river and harbor act of 1899.	

## APPROPRIATIONS.

July 11, 1870-----	\$50,000.00	September 19, 1890-----	\$200,000.00
March 3, 1871-----	50,000.00	July 13, 1892-----	200,000.00
June 10, 1872-----	50,000.00	August 18, 1894-----	100,000.00
March 3, 1873-----	75,000.00	June 3, 1896-----	120,000.00
June 23, 1874-----	50,000.00	March 3, 1899-----	150,000.00
March 3, 1875-----	50,000.00	June 13, 1902-----	300,000.00
August 14, 1876-----	60,000.00	March 3, 1905-----	200,000.00
June 18, 1878-----	70,000.00	March 2, 1907-----	200,000.00
March 3, 1879-----	75,000.00		
June 14, 1880-----	75,000.00		2,622,500.00
March 3, 1881-----	60,000.00	Received from sale of	
August 2, 1882-----	75,000.00	condemned property--	331.83
July 5, 1884-----	75,000.00	Other receipts-----	.67
August 5, 1886-----	112,500.00		
August 11, 1888-----	225,000.00	Total -----	2,622,832.50

## CONTRACTS IN FORCE.

Contractor: J. Clements Shafer, of Richmond, Va., for dredging, removing rock, constructing, repairing, and degrading jetties, and constructing dikes in James River, Virginia.

Date of contract: February 4, 1903.

Approved: March 4, 1903.

Date for commencement: April 5, 1903.

Date for completion: April 5, 1905. Time limit for completion of contract has been waived.

Amount and rate: Clearing and enlarging channel—164,620 cubic yards of earth excavation, at 28 cents per cubic yard; cobblestone, 28 cents per cubic yard; soft rock, 28 cents per cubic yard, and hard rock, \$5 per cubic yard. Degrading jetties—earth, 28 cents per cubic yard; hard rock, \$3.50 per cubic yard. Conveying 128,000 cubic yards, at 16 cents per cubic yard; transporting 6,226 cubic yards, at 9½ cents per cubic yard, and transporting 102,000 cubic yards, at 18 cents per cubic yard. Dike and jetty construction and jetty repairs—5,399 linear feet of pine piles, 12 to 35 feet long, at 27 cents per linear foot in place; 2,441 linear feet of oak piles, 16 to 25 feet long, at 45 cents per linear foot in place; 1,068 linear feet of oak piles, 30 to 35 feet long, at 45 cents per linear foot in place; 23,728 feet B. M. white oak wales, \$48 per 1,000 feet B. M. in place; 4,500 feet B. M. white oak stringpieces, at \$48 per 1,000 feet B. M. in place; 93,384 feet B. M. pine sheet piling, at \$34.50 per 1,000 feet B. M. in place, and 40,500 feet B. M. oak sheet piling, at \$48 per 1,000 feet B. M. in place.

Contractor: P. Sanford Ross (Incorporated), of Jersey City, N. J., for dredging, removing rock, and constructing and repairing jetties in James River, Virginia.

Date of contract: January 29, 1906.

Approved: February 12, 1906.

Date for commencement: March 16, 1906—extended to April 15, 1906.

Date for completion: June 16, 1908.

Amount and rate: 102,461 cubic yards earth excavation, at 27½ cents per cubic yard; 18,818 cubic yards hard rock excavation, at \$5.90 per cubic yard; conveying 54,640 cubic yards excavated material from scows to points of deposit, at 18 cents per cubic yard; transporting 1,000 cubic yards excavated material on deck scows below Jetty No. 134, at 10 cents per cubic yard; transporting 60,000 cubic yards excavated material on dump scows to vicinity of Jordans Point, at 17½ cents per cubic yard; 4,259 linear feet round pine piles, 10 to 30 feet long, in place, at 35 cents per linear foot; 530 linear feet round oak piles, 25 to 35 feet long, in place, at 50 cents per linear foot; 15,596 feet B. M. white oak wales in place, at \$50 per M feet B. M.; 2,833 feet B. M. white oak stringpieces in place, at \$50 per M feet B. M.; 75,888 feet B. M. merchantable pine sheet piling in place, at \$39 per M feet B. M.

## COMMERCIAL STATISTICS.

*Receipts and shipments by water, calendar year 1906.*

Articles.	Port of Richmond, Va.			Points on James River other than Richmond, Va.			Total tonnage.
	Receipts.	Shipments.	Amount.	Receipts.	Shipments.	Amount.	
Asphalt blocks, bricks, etc....	8,074	-----	8,074	6,255	15,086	21,291	29,365
Cattle .....	-----	-----	-----	57	39	96	96
Cement, lime, etc. ....	3,970	-----	3,970	1,572	2	1,574	5,544
Coal .....	48,022	88	48,110	2,369	101	2,470	50,580
Cordwood .....	715	1,980	2,645	1,000	36,240	37,240	39,885
Fertilizer and fertilizer material .....	17,646	1,452	19,098	4,648	60	4,703	23,801
Fish and oysters .....	3,958	-----	3,958	217	137	354	4,307
Flour .....	-----	25	25	619	20	639	664
Grain .....	958	561	1,519	2,068	397	2,460	3,989
Groceries .....	-----	-----	-----	48,662	17,105	60,767	60,767
Hardware .....	640	13	653	1,349	194	1,543	2,196
Hay, straw, etc. ....	125	-----	125	1,447	1,890	3,327	3,452
Hogs .....	-----	-----	-----	71	25	96	96
Horses .....	-----	-----	-----	114	57	171	171
Ice .....	-----	-----	-----	502	5	507	507
Logs .....	19,831	-----	19,831	-----	-----	-----	19,831
Lumber .....	5,945	1,520	7,465	711	113,694	114,405	121,870
Oil .....	31,547	-----	31,547	696	-----	696	32,243
Peanuts .....	-----	-----	-----	82	208	290	290
Railroad ties .....	-----	5,479	5,479	50	5,818	5,868	11,347
Salt .....	1,500	-----	1,500	-----	-----	-----	1,500
Sand .....	2,003	-----	2,003	-----	-----	-----	2,003
Unclassified freight .....	48,571	36,749	85,320	22,107	5,907	28,014	113,334
<b>Total .....</b>	<b>198,500</b>	<b>47,817</b>	<b>241,317</b>	<b>89,676</b>	<b>196,925</b>	<b>286,501</b>	<b>527,818</b>

Returns received of arrivals and departures of vessels were too incomplete for report.

## K II.

## CONSTRUCTION OF PIERS, HAMPTON ROADS, JAMESTOWN EXPOSITION.

## WORK OF THE FISCAL YEAR ENDED JUNE 30, 1907.

A description of the project and of the conditions existing prior to commencement of the work will be found in the summary of the Chief of Engineers, page 247.

The work originally called for consisted of two piers, each 150 feet wide and 1,200 feet long, inclosing a basin about 547 feet wide and 1,100 feet long dredged to a depth of 12 feet. On each side of the basin are six boat landings connected with the piers. At the shore end of the basin is a single landing about 350 feet long to be reserved for use of the United States Government and foreign naval boats. The entrance to the basin is under a reinforced concrete arch of 150 feet span and 30 feet in height at mean high water, joining the outer ends of the two piers.

Along the shore for a distance of 1,900 feet (except opposite the shore end of each pier) is a wooden bulkhead, to hold a fill between it and the original shore line. The piers proper are 150 feet in width and consist of two reinforced concrete retaining walls, supported on round and inclined sheet piles, the space between the walls being filled

with material dredged from the basin. The head of the pier is of similar construction except for the arch and abutments.

The piers and shore bulkheads are surmounted by many ornamental structures of a temporary character. They will be maintained and lighted by the exposition company.

In addition to the above work a channel of approach to the piers about 200 feet wide and 12 feet deep at mean low water and a basin in Bush Creek for the life-saving exhibit were provided for by act of Congress dated February 9, 1907.

Preliminary work for the piers was begun as soon as the contract had been signed. By December 31, 1906, a railroad siding had been built to the site of the work, temporary buildings had been erected, a considerable amount of material had been delivered and pile driving had been started. From January 1 to January 15, 1907, rapid progress in actual construction was made, but, mainly on account of the weather, very little progress was made from January 15 to March 1. Since March 1 the progress has been better, but it has not been satisfactory. It is believed that the main cause of delay was the failure of the contractors to make proper allowances for the weather and for labor conditions in connection with exposition work. Very few delays were due to lack of material. Except for the dredging, an ample plant has always been available.

The work was so far advanced that the President was able to land at the piers on April 26, the opening day of the exposition, and since that date the basin and piers have been in constant use by boats from the United States and foreign naval vessels anchored in Hampton Roads.

The work of dredging the channel of approach and dredging in Bush Creek was assigned to this office on February 14, 1907. A survey was at once made and the work in the channel of approach was let to the Scofield Company by supplemental contract approved March 12, 1907. Work was begun during March, but progressed slowly during March, April, and May. During June the weather conditions were better, softer material was encountered, and better progress was made. The expenditures on the piers amounted to \$238,605.77 and on the channel of approach to \$18,165.17.

In Bush Creek a basin with a maximum width of 85 feet, a maximum depth of 12 feet, and a maximum length of about 350 feet was dredged to afford a drill ground for the life-saving exhibit. This work was done chiefly by hiring such dredges as could be secured, and the total cost was \$3,965.26. It was impossible to obtain a really suitable dredge until after June 1. Some of the material had to be handled several times. In all, four dredges were tried, one of them being a Government dredge borrowed from the Norfolk office.

The work in Bush Creek has been completed. The piers and basin are about 84 per cent completed and the channel of approach is about 68 per cent completed.

In accordance with the terms of the contract liquidated damages to the amount of \$100 per day have since May 2 been deducted from the amounts due the contractor, as well as the cost of inspection and superintendence.

The following table gives the estimated quantities of the principal classes of work and the proportion done to June 30, 1907:

	Estimated quantity.	Per cent completed on June 30, 1907.
Round piles.....	3,750	98
Sheet piles, plain.....ft. B. M.	477,000	96
Sheet piles, creosoted.....ft. B. M.	288,000	96
Concrete, wall.....cu. yds.	3,000	76
Concrete, arch.....cu. yds.	1,770	87
Wales, creosoted.....ft. B. M.	30,000	96
Yellow pine, short leaf.....ft. B. M.	180,000	95
Yellow pine, long leaf.....ft. B. M.	580,000	81
Thacher bars.....lbs.	215,000	90
Dredging, basin.....cu. yds.	219,000	91
Railings and staff.....value.	\$71,247.80	66
Plumbing.....value.	\$15,000.00	90

At the close of the fiscal year the principal items of work remaining to be done were:

Dredging inside the basin (91 per cent completed); filling behind east bulkhead; completing the fill on the west pier and at heads of both piers; building concrete steps over the arch, and walls for its approaches; closing the gap east of the arch left to afford vessels access to the basin before removal of the centering; finishing the carpentry work and the staff and plaster on the west pier and both towers, and completing the dredging of the channel of approach (68 per cent completed).

While the above uncompleted work and the plant employed on it mar somewhat the appearance of the piers, they do not prevent the constant use of the latter for the purpose for which they were built.

The construction of these extensive piers, involving the driving of many thousands of piles, the dredging of several hundred thousand yards of sand and mud, and the building of long lines of thin concrete walls along an exposed bay front during the most stormy and unfavorable months of the year, has been a serious and difficult engineering problem. Under ordinary conditions the work would have taken a year or more to complete.

#### *Money statement.*

Amount appropriated by act approved June 30, 1906.....	\$400,000.00
Amount appropriated by act approved February 9, 1907.....	65,000.00
	465,000.00
June 30, 1907, amount expended during fiscal year.....	260,736.20
	204,263.80
July 1, 1907, balance unexpended.....	3,136.21
July 1, 1907, outstanding liabilities.....	
	201,127.59
July 1, 1907, balance available.....	
July 1, 1907, amount covered by uncompleted contracts.....	193,419.79

#### APPROPRIATIONS.

Amount appropriated by act of Congress approved June 30, 1906.....	\$400,000
Amount appropriated by act of Congress approved February 9, 1907..	65,000
Total.....	465,000

## CONTRACTS IN FORCE.

Contractor: The Scofield Company, of Philadelphia, Pa., for construction of piers.

Amount: \$385,000.

Date of contract: November 1, 1906.

Approved: November 3, 1906.

Date for commencement: November 3, 1906.

Date for completion: May 2, 1907. (Liquidated damages of \$100 per day for each day after May 2, 1907.)

Contractor: The Scofield Company, of Philadelphia, Pa., for dredging and changes in approved plans. (Supplemental contract.)

Date of contract: March 5, 1907.

Approved: March 12, 1907.

## K 12.

## PERMANENT LANDING PIER. JAMESTOWN ISLAND, VIRGINIA.

WORK OF THE FISCAL YEAR ENDED JUNE 30, 1907.

Negotiations for purchasing the only existing pier, belonging to Mrs. Louise J. Barney, were entered into as soon as the work was assigned to this office, but were finally given up in November, 1906, as it was found impossible to come to satisfactory terms with the owner. On December 17 the Secretary of War approved the general plan and location of the proposed new pier and authorized its construction by contract. Plans and specifications were then drawn up and every preparation made to start the work, but further progress was stopped by the delay on the part of the Association for the Preservation of Virginia Antiquities in donating to the United States, as required by law, the land on the frontage owned by them upon which the pier would abut. They were informed that until the land needed for the pier upon their frontage was donated to the United States all further steps toward the construction of a new wharf must cease.

At the request of the representative of the association no further steps looking toward the erection of a new pier or the purchase or lease of the existing one are being taken by the Government pending the outcome of efforts being made by the association to enter into an agreement with Mrs. Barney providing for the use of her wharf during the period of the exposition without expense to the Government. It is believed such an agreement has been arrived at, though no definite information concerning this has been received.

*Money statement.*

Amount appropriated by act approved June 30, 1906.....	\$15,000.00
June 30, 1907, amount expended during fiscal year.....	338.56
July 1, 1907, balance unexpended.....	14,461.44



## K 13.

## REMOVING SUNKEN VESSELS OR CRAFT OBSTRUCTING OR ENDANGERING NAVIGATION.

## WORK OF THE FISCAL YEAR ENDED JUNE 30, 1907.

(a) *Wreck of barge Laurel in Monroe Bay, Virginia.*—This wreck was reported as an obstruction to navigation on July 23, 1906. An allotment of \$20 for defraying the expense of an examination of the wreck was made July 31, 1906, and expended.

The examination was made August 7. The wreck was found to be that of an old steamer nearly 300 feet long which had been converted into a sand barge. In September, 1892, this barge when partially loaded with sand grounded on each side of the narrow channel at the entrance to Monroe Bay and broke in two as the tide fell, constituting a serious obstruction to the navigation of the bay. The depth of water about the wreck was 9 to 10 feet at low tide.

A report of this examination was submitted to the Chief of Engineers August 10, and on August 14 an allotment of \$500 was made for the removal of the wreck.

Between September 25 and 29, 1906, the wreck was thoroughly broken up by blasting and leveled off to the elevation of the surrounding bottom. Loose pieces of the wreck were taken ashore and secured. After the removal of the wreck had been completed the bottom was carefully swept. The work was done by hired labor and the crew of the United States steamer *General Warren*.

The total expenditure incurred in removing this wreck was \$402.36. Nothing of value was recovered from it.

(b) *Wreck of dredge City of Richmond in James River, at Richmond, Va.*—The dredge *City of Richmond*, belonging to Mr. J. C. Cheatwood, of Richmond, Va., was burned December 16, 1906, and sunk in the channel of James River at the upper end of Richmond Harbor. The owner of the wreck was repeatedly requested to remove it, and although he stated that it was his intention to do so, he allowed so much time to elapse without apparently taking any steps toward this end that it became necessary for the United States to undertake the work of removal. Formal notice was given to Mr. Cheatwood on May 17, 1907, of the intention of the Government to take possession of and remove the wreck unless he should begin its removal within ten days.

Under authority of the Secretary of War sealed proposals were invited under date of June 11, 1907, for doing the work. Only two bids were received in reply, both more than double the amount of the allotment. An increase of the latter will be asked for.



## APPENDIX L.

### IMPROVEMENT OF NORFOLK HARBOR, VIRGINIA, AND ITS APPROACHES, AND OF CERTAIN WATERWAYS AND HARBORS IN SOUTHEASTERN VIRGINIA AND NORTHEASTERN NORTH CAROLINA.

REPORT OF MAJ. JOSEPH E. KUHN, CORPS OF ENGINEERS, OFFICER IN CHARGE, FOR THE FISCAL YEAR ENDING JUNE 30, 1907.

#### IMPROVEMENTS.

- |  |   |
|--|---|
| 1. Harbor at Norfolk and its approaches, Virginia.                   | 9. Inland water route from Norfolk, Virginia, to Albemarle Sound, North Carolina. |
| 2. Western Branch of Elizabeth River, Virginia.                      | 10. Perquimans River, North Carolina.   |
| 3. Hampton Roads, Virginia.  | 11. Blackwater River, Virginia.   |
| 4. Nansemond River, Virginia.  | 12. Meherrin River, North Carolina.   |
| 5. Pagan River, Virginia.  | 13. Roanoke River, North Carolina.  |
| 6. Appomattox River, Virginia.                                       | 14. Removing sunken vessels or craft obstructing or endangering navigation.       |
| 7. Harbor at Cape Charles City, Virginia.                            |   |
| 8. Waterway from Norfolk, Virginia, to the sounds of North Carolina. |   |

ENGINEER OFFICE, UNITED STATES ARMY,  
*Norfolk, Va., July 10, 1907.*

GENERAL: I have the honor to transmit herewith my annual report upon the works of river and harbor improvement, now in my charge, for the fiscal year ended June 30, 1907.

Very respectfully, your obedient servant,

JOSEPH E. KUHN,  
*Major, Corps of Engineers.*

Brig. Gen. A. MACKENZIE,  
*Chief of Engineers, U. S. A.*

#### L 1.

### IMPROVEMENT OF HARBOR AT NORFOLK AND ITS APPROACHES, VIRGINIA.

#### (A) GENERAL IMPROVEMENT.

Owing to lack of funds no active operations were in progress during the year. The expenditures incurred were for surveying in con-

nection with harbor lines and for the location of new water-front structures; for resounding the entire channel; for the operation of the survey steamer in connection with inspection, and for office expenses. Project and specifications for completing the dredging in the Eastern Branch of the Elizabeth River were also prepared.

*Money statement.*

July 1, 1906, balance unexpended.....	\$9,514.82
Amount appropriated by river and harbor act approved March 2, 1907.....	37,825.00
Received on account of sales.....	9.10
	<hr/> 47,348.92
June 30, 1907, amount expended during fiscal year, for works of improvement.....	5,863.33
	<hr/> 41,485.59
<hr/>	
{ Amount that can be profitably expended in fiscal year ending June 30, 1909, for maintenance of improvement, in addition to the balance unexpended July 1, 1907.....	20,000.00
{ Submitted in compliance with requirements of sundry civil act of June 4, 1897, and of section 7 of the river and harbor act of 1899.	

(B) HOSPITAL POINT.

There were no operations during the fiscal year. The expenditures incurred were for resounding the channel, for the operation of the survey steamer in connection with inspections, and for office expenses.

*Money statement.*

July 1, 1906, balance unexpended.....	\$7,809.34
June 30, 1907, amount expended during fiscal year, for works of improvement.....	1,416.95
	<hr/> 6,392.39

(C) THIRTY-FOOT CHANNEL.

This is a new project, adopted by Congress March 2, 1907, under a continuing contract. For further information as to the project reference should be made to the current summary.

No work has yet been done on the new project other than the preparation of a project and the invitation of proposals for dredging, which were opened on June 29, 1907.

*Money statement.*

Amount appropriated by river and harbor act approved March 2, 1907, \$282,000. 00	
June 30, 1907, amount expended during fiscal year, for works of improvement .....	982. 84
July 1, 1907, balance unexpended .....	281,017. 16
Amount (estimated) required for completion of existing project .....	850,000. 00
Amount that can be profitably expended in fiscal year ending June 30, 1909, for works of improvement, in addition to the balance unexpended July 1, 1907 .....	350,000. 00
Submitted in compliance with requirements of sundry civil act of June 4, 1907.	

## APPROPRIATIONS.

Improving harbor at Norfolk, Va.:	
August 14, 1876 .....	\$35,000. 00
June 18, 1878 .....	50,000. 00
March 3, 1879 .....	75,000. 00
June 14, 1880 .....	50,000. 00
March 3, 1881 .....	75,000. 00
August 2, 1882 .....	75,000. 00
July 5, 1884 .....	75,000. 00
August 5, 1886 .....	187,500. 00
August 11, 1888 .....	60,000. 00
September 19, 1890 .....	150,000. 00
July 13, 1892 .....	150,000. 00
August 18, 1894 .....	100,000. 00
June 3, 1896 .....	100,000. 00
June 13, 1902 .....	30,000. 00
March 3, 1903 .....	183,957. 00
March 3, 1905 .....	40,000. 00
March 2, 1907 .....	319,825. 00
Allotment of November 23, 1904, from act of April 28, 1904, for "Emergencies in River and Harbor Works" .....	30,000. 00
Improving Elizabeth River, Virginia:	
July 7, 1898 .....	360,000. 00
Total .....	2,146,282. 00
Received from sales of property .....	10. 71
Total .....	2,146,292. 71
Amount turned into surplus fund of the Treasury from appropriation of July 7, 1898 .....	483. 58
Aggregate .....	2,145,809. 13

## COMMERCIAL STATISTICS.

The following statistics, relative to the commerce of the harbor of Norfolk, Va., during the calendar year 1906, were compiled from statements furnished by parties engaged in making shipments over this waterway:

Articles.	Amount.	Value.	Articles.	Amount.	Value.
	<i>Tons.</i>			<i>Tons.</i>	
Brick .....	32,000	\$91,500. 00	Ice .....	12,000	\$80,000. 00
Cement .....	5,075	45,000. 00	Jute bagging .....	1,411	81,600. 00
Clay .....	37,800	13,125. 00	Lime .....	5,595	16,785. 00
Copper ore .....	16,384	94,755. 00	Logs .....	383,829	940,100. 55
Chemicals .....	76,386	831,038. 00	Lumber .....	428,038	4,192,571. 22
Coal .....	4,557,097	18,298,230. 63	Pig iron .....	26,140	522,800. 00
Coke .....	299,890	899,670. 00	Miscellaneous .....	9,666,036	606,092,134. 00
Corn .....	13,580	220,460. 00			
Fertilizer .....	101,864	1,979,962. 00	Total .....	15,662,080	628,380,721. 40

The deepest draft vessel using the channel during the year 1906 was steamship *Massachusetts*, drawing 30 feet with 7,913 tons of coal.

# 1204 REPORT OF THE CHIEF OF ENGINEERS, U. S. ARMY.

*Approximate amount of freight handled by water during various years.*

Year.	Quantity.	Year.	Quantity.
	<i>Tons.</i>		<i>Tons.</i>
1888 ..	1,914,506	1898 ..	6,510,201
1889 ..	2,243,087	1899 ..	6,260,284
1890 ..	2,584,841	1900 ..	5,538,061
1891 ..	2,931,751	1901 ..	7,761,356
1892 ..	3,427,189	1902 ..	7,853,108
1893 ..	3,684,727	1903 ..	9,478,900
1894 ..	4,545,049	1904 ..	10,780,972
1895 ..	5,013,185	1905 ..	10,914,378
1896 ..	5,986,636	1906 ..	15,662,080
1897 ..	9,430,026		

The marked increase in tonnage for the year 1906 is attributable in part to the steady growth of commerce in Norfolk Harbor, but largely to the abnormal business activity incident to the Jamestown Tercentennial Exposition.

## L 2.

### IMPROVEMENT OF WESTERN BRANCH OF ELIZABETH RIVER, VIRGINIA.

No operations were carried on during the fiscal year and no expenditures were incurred.

The project has been completed.

#### *Money statement.*

July 1, 1906, balance unexpended .....	\$328.35
July 1, 1907, balance unexpended .....	328.35

#### APPROPRIATION.

June 3, 1896 .....	\$45,000
--------------------	----------

#### COMMERCIAL STATISTICS.

The following statistics, showing the commerce on this river, were compiled from statements made by shippers:

Articles.	Amount.	Value.
	<i>Tons.</i>	
Logs .....	11,250	\$45,000
Lumber .....	1,250	10,000
Ore, copper .....	16,384	94,755
Truck packages .....	6,500	130,000
Miscellaneous .....	4,189,795	36,309,250
Total .....	4,225,179	36,589,005

*Approximate amount of freight handled by water during various years.*

Year.	Quantity.	Year.	Quantity.
	<i>Tons.</i>		<i>Tons.</i>
1896.....	211,653	1902.....	1,065,488
1897.....	244,808	1903.....	1,225,709
1898.....	346,385	1904.....	1,178,439
1899.....	576,898	1905.....	1,828,657
1900.....	(a)	1906.....	4,189,796
1901.....	1,383,105		

\* Not compiled.

### L 3.

#### IMPROVEMENT OF HAMPTON ROADS, VIRGINIA.

No operations other than the preparation of a project for the expenditure of the amount appropriated by the act of March 2, 1907, were carried on during the fiscal year, and no expenditures were incurred.

The project has been completed, but in order to maintain the project depth and width dredging of portions of the channel will be required from time to time. The amount appropriated by the act of March 2, 1907, will be applied to maintaining the channel, which is an important one, being the approach to Newport News, Va.

#### *Money statement.*

July 1, 1906, balance unexpended.....	\$287. 00
Amount appropriated by river and harbor act approved March 2, 1907.....	12, 500. 00
	<hr/> 12, 787. 00
June 30, 1907, amount expended during fiscal year, for works of improvement.....	230. 51
July 1, 1907, balance unexpended.....	12, 556. 49
	<hr/> <hr/>
{ Amount that can be profitably expended in fiscal year ending June 30, 1909, for maintenance of improvement, in addition to the balance unexpended July 1, 1907.....	12, 500. 00
{ Submitted in compliance with requirements of sundry civil act of June 4, 1897, and of section 7 of the river and harbor act of 1899.	

#### APPROPRIATIONS.

June 13, 1902.....	\$10, 000
March 3, 1903.....	215, 000
March 2, 1907.....	12, 500
	<hr/>
Total.....	237, 500

## COMMERCIAL STATISTICS.

The following statistics were compiled from statements of shippers at Newport News, which shows the traffic during the calendar year 1906, by way of Hampton Roads, to and from Newport News:

Articles.	Quantity.	Value.
	<i>Tons.</i>	
Coal.....	3,796,897	\$11,430,699.60
Grain.....	274,606	8,238,180.00
Miscellaneous.....	1,472,583	433,701,483.40
Total.....	5,544,086	453,370,363.00

*Approximate amount of freight handled by water during various years.*

Year.	Quantity.	Year.	Quantity.
	<i>Tons.</i>		<i>Tons.</i>
1901.....	3,736,443	1904.....	4,208,781
1902.....	2,663,669	1905.....	4,717,858
1903.....	2,826,558	1906.....	5,544,086

## L 4.

## IMPROVEMENT OF NANSEMOND RIVER, VIRGINIA.

No operations other than the preparation of a project for the expenditure of the appropriation made by the act of March 2, 1907, were carried on during the year and no expenditures were incurred.

The amount appropriated by the act of March 2, 1907, will be applied to continuing work on the approved project and to maintaining the existing channel.

*Money statement.*

July 1, 1906, balance unexpended.....	\$53.39
Amount appropriated by river and harbor act approved March 2, 1907.....	5,000.00
July 1, 1907, balance unexpended.....	5,053.39
Amount (estimated) required for completion of existing project.....	7,769.50
{ Amount that can be profitably expended in fiscal year ending June 30, 1909, for maintenance of improvement, in addition to the balance unexpended July 1, 1907.....	5,000.00
{ Submitted in compliance with requirements of sundry civil act of June 4, 1897, and of section 7 of the river and harbor act of 1899.	

## APPROPRIATIONS.

March 3, 1873.....	\$15,000	July 13, 1892.....	\$10,000
March 23, 1874.....	10,000	August 15, 1894.....	10,000
March 3, 1875.....	5,000	June 3, 1896.....	5,000
March 14, 1876.....	5,000	March 3, 1899.....	5,000
June 18, 1878.....	2,000	March 2, 1907.....	5,000
August 11, 1888.....	10,000		
September 19, 1890.....	10,000	Total.....	92,000



## COMMERCIAL STATISTICS.

The following statistics relative to the commerce of the Nansemond River, Virginia, during the calendar year 1906, were compiled from statements of parties making shipments by the river:

Articles.	Quantity.	Value.
	<i>Tons.</i>	
Brick .....	20,000	\$40,000
Clay .....	37,500	13,125
Coal .....	4,900	16,500
Lumber .....	14,339	186,193
Miscellaneous.....	14,324	3,963,700
Total.....	91,063	4,239,518

*Approximate amount of freight handled by water during various years.*

Year.	Quantity.	Year.	Quantity.
	<i>Tons.</i>		<i>Tons.</i>
1888 .....	109,900	1898 .....	31,796
1890 .....	217,338	1900 .....	16,693
1891 .....	78,672	1901 .....	119,892
1892 .....	133,723	1902 .....	50,950
1893 .....	59,478	1903 .....	36,127
1894 .....	53,762	1904 .....	22,119
1895 .....	59,701	1905 .....	77,204
1896 .....	61,405	1906 .....	91,063
1897 .....	43,500		

## L 5.

## IMPROVEMENT OF PAGAN RIVER, VIRGINIA.

No work done. The expenditures made were on account of outstanding liabilities for dredging done during the previous fiscal year. The project for this stream has been completed, but maintenance work will be required from time to time, especially on the bar at the mouth of the river.

*Money statement.*

July 1, 1906, balance unexpended .....	\$2,366.81
June 30, 1907, amount expended during fiscal year, for works of improvement .....	2,167.82
July 1, 1907, balance unexpended .....	198.99

## APPROPRIATIONS.

June 14, 1880 .....	\$5,000
March 3, 1881 .....	5,000
June 13, 1902 .....	10,870
Total .....	20,870

## COMMERCIAL STATISTICS.

The following statistics represent the commerce of Pagan River, Virginia, during the calendar year 1906:

Articles.	Quantity.	Value.
	<i>Tons.</i>	
Coal.....	1,200	\$4,800
Miscellaneous.....	86,905	8,680,500
Total.....	87,505	8,685,300

The Old Dominion Steamship Company operates two steamers on this river as far as Smithfield, Va., each making a round trip daily, except Sundays, from Norfolk, Va.

*Approximate amount of freight handled by water during various years.*

Year.	Quantity.	Year.	Quantity.
	<i>Tons.</i>		<i>Tons.</i>
1901.....	108,068	1904.....	85,078
1902.....	75,614	1905.....	82,207
1903.....	120,121	1906.....	87,506

## L 6.

## IMPROVEMENT OF APPOMATTOX RIVER, VIRGINIA.

## (A) MAINTENANCE.

During the fiscal year an emergency contract was entered into for clearing the channel of deposits brought down by freshets and which had seriously impeded the navigation of the river. Work under this contract was commenced October 30, 1906, and completed February 12, 1907. During this time a total of 19,784 cubic yards of material, place measurement, was pumped ashore. The work of excavation was carried on over several shoals between Closure Dike shoal, about 2 miles below the city of Petersburg and the head of navigation at the city. The excavation was carried to a depth of 12 feet at high water and in cuts 40 feet wide. The contract price was 44 $\frac{1}{10}$  cents per cubic yard.

The completion of the approved project is intimately connected with the diversion work at Petersburg and should be undertaken immediately upon the completion of the latter. As matters now stand, the existing river channel receives a heavy charge of sediment with each freshet, which forms a series of bars extending from the city of Petersburg to Point of Rocks, a distance of about 8 miles, and renders any degree of permanency in the channel out of question.

*Money statement.*

July 1, 1906, balance unexpended.....	\$10,004. 70
Amount appropriated by river and harbor act approved March 2, 1907.....	50,000. 00
	60,004. 70
June 30, 1907, amount expended during fiscal year, for maintenance of improvement .....	10,071. 37
July 1, 1907, balance unexpended.....	49,933. 33

## (B) AT PETERSBURG.

This work is not directly a project for the improvement of an existing channel, but a project for diverting the course of the Appomattox River from its present channel into a former geological channel, this with a view to freeing the existing channel from receiving sediment brought down by freshets.

Work has continued throughout the fiscal year under contract. The following statement shows the quantity and cost of work done under the contract described hereinafter, during the fiscal year ended June 30, 1907:

Locality.	Quantity done.	Unit price.	Cost of work during fiscal year, 1907.
	<i>Cu. yards.</i>		
Section A.....	174	\$0.22	\$38.28
Section B.....	14,751	.40	5,900.40
Section C.....	42,746	.18	7,694.28
Section D.....	50,629	.18	9,113.22
Placed in Pocahontas levee.....	185	.50	92.50
From railroad embankment.....	2,860	.40	1,144.00
Fill behind south abutment.....	911	.40	364.40
Concrete for railroad piers.....	901.6	10.00	9,016.00
Rock removed excavating pier foundations.....	16.8	2.25	37.80
Total.....			33,400.88

The project is about 60 per cent completed, and funds are available for the remaining work, all of which is covered by a single contract. The contractor is far behind the date fixed for the completion of his work and is making slow progress.

*Money statement.*

July 1, 1906, balance unexpended.....	\$133,719.38
June 30, 1907, amount expended during fiscal year, for works of improvement.....	35,761.46
July 1, 1907, balance unexpended.....	97,957.92
July 1, 1907, outstanding liabilities.....	265.00
July 1, 1907, balance available.....	97,692.92
July 1, 1907, amount covered by uncompleted contracts.....	72,427.15

## APPROPRIATIONS.

March, 3, 1871.....	\$50,000.00	June 3, 1896.....	\$5,000.00
June 10, 1872.....	40,000.00	March 3, 1899.....	5,000.00
March 3, 1873.....	30,000.00	June 13, 1902.....	32,500.00
June 23, 1874.....	30,000.00	March 3, 1903.....	175,000.00
March 3, 1875.....	30,000.00	March 3, 1905.....	10,000.00
August 14, 1876.....	30,000.00	March 2, 1907.....	50,000.00
June 18, 1878.....	30,000.00	"Emergencies in River and Harbor Works:"	
March 3, 1879.....	20,000.00	June 6, 1900.....	5,000.00
June 14, 1880.....	20,000.00	April 28, 1904.....	12,000.00
March 3, 1881.....	20,000.00	Total.....	723,330.00
August 2, 1882.....	35,000.00	Repaid to appropriation for "Emergencies in River and Harbor Works".....	331.70
July 5, 1884.....	25,000.00	Aggregate.....	722,998.30
August 5, 1886.....	18,750.00		
August 11, 1888.....	15,000.00		
September 19, 1890.....	15,000.00		
July 13, 1892.....	15,080.00		
August 18, 1894.....	5,000.00		

## CONTRACTS IN FORCE.

## MAINTENANCE.

With W. H. French, for dredging, dated October 22, 1906; date for commencement, October 27, 1906; date for completion, January 27, 1907 (time limit waived). Price, 44 $\frac{1}{2}$  cents per cubic yard, measured in place.

## AT PETERSBURG.

With Atlantic Dredging Company, for dredging and building embankments, dam, highway bridge, railroad bridge, piers, and flume, dated July 14, 1904; approved July 30, 1904; work commenced October 3, 1904; date for expiration, October 3, 1906 (time limit waived). Prices: Section A (a), 40 cents per cubic yard, measured in the cut; (b), 22 cents per cubic yard, measured in the cut; Section B, 40 cents per cubic yard, measured in the cut; Section C (a), 50 cents per cubic yard, measured in the fill; (b), 18 cents per cubic yard, measured in the cut; Section D, 18 cents per cubic yard, measured in the cut; rock for dam, \$1.70 per gross ton for large, \$1.70 per gross ton for medium, \$1.90 per gross ton for crushed stone; railroad bridge, piers, and abutments, for concrete, \$10 per cubic yard, measured in place; for coping, \$20 per square yard of horizontal area; for fill behind abutments, 40 cents per cubic yard, measured in the fill; highway bridge, \$14,000; flume, \$2,000; revetment, \$1.50 per square yard.

## COMMERCIAL STATISTICS.

The following statistics relative to the commerce of the Appomattox River, Virginia, during the calendar year 1906 were compiled from statement furnished by W. N. Mays, harbor master:

Articles.	Amount.	Value.
	<i>Tons.</i>	<i>Dollars.</i>
Coal.....	1,602	12,284
Fertilizer.....	9,610	96,100
Lumber.....	8,776	58,640
Peanuts.....	300	24,000
Railroad ties.....	250	20,000
Miscellaneous.....	10,000	300,000
Total.....	30,438	510,924

## Vessels.

Class.	Number.	Average draft.	Average tonnage.
		<i>Fect.</i>	<i>Tons.</i>
Steam.....	654	6	100
Sail.....	58	8	100
Barges.....	156	9	350
Total.....	868		

## Approximate amount of freight handled by water during previous years.

Year.	Quantity.	Year.	Quantity.
	<i>Tons.</i>		<i>Tons.</i>
1888.....	30,626	1899.....	(a)
1889.....	26,121	1900.....	155,745
1890.....	21,693	1901.....	145,509
1891.....	26,275	1902.....	100,648
1892.....	25,218	1903.....	108,628
1896.....	81,318	1904.....	42,337
1897.....	84,031	1905.....	53,282
1898.....	95,941	1906.....	30,438

\* Not obtained.

## L 7.

## IMPROVEMENT OF HARBOR AT CAPE CHARLES CITY, VIRGINIA.

From September 19 to 28, 1906, there was dredged to a depth of 16 feet an area of 50 feet by 30 feet in the channel of approach to the harbor. The amount of material removed was 285 cubic yards, making with that previously removed 35,696 cubic yards. The contract price is 19½ cents per cubic yard, scow measurement. The contractor, having failed to continue his operations, his contract, by authority of the Chief of Engineers, was annulled on June 17, 1907. The contractor had completed about 30 per cent of the contract when annulled. The expenditures made during the year were for inspection and contingencies, the amount earned by the contractor having been insufficient to defray the cost of inspection which was chargeable to him on account of failure to complete contract on time.

*Money statement.*

July 1, 1906, balance unexpended.....	\$16, 899. 88
Amount appropriated by river and harbor act approved March 2, 1907 .....	25, 000. 00
	<hr/> 41, 899. 88
June 30, 1907, amount expended during fiscal year, for works of improvement.....	662. 31
July 1, 1907, balance unexpended.....	<hr/> 41, 237. 57
Amount (estimated) required for completion of existing project.....	<hr/> 17, 340. 00
<hr/>	
{ Amount that can be profitably expended in fiscal year ending June 30, 1909, for works of improvement, in addition to the balance unexpended July 1, 1907.....	15, 000. 00
{ Submitted in compliance with requirements of sundry civil act of June 4, 1907.	

## APPROPRIATIONS.

September 19, 1890 .....	\$25, 000	March 3, 1905.....	\$25, 000
July 13, 1892.....	10, 000	March 2, 1907.....	25, 000
March 3, 1899.....	20, 000		
June 13, 1902 .....	20, 000	Total.....	<hr/> 125, 000

## CONTRACT IN FORCE.

With John L. Grim, for dredging, dated September 12, 1905; approved October 14, 1905; date for commencing work January 22, 1906; date for completion, July 22, 1906 (time limit waived). Price, 19½ cents per cubic yard, scow measurement.

## COMMERCIAL STATISTICS.

The following statement represents the commerce of the harbor at Cape Charles City, Va., during the calendar year 1906, and was prepared from statements supplied by lines and individuals handling the freight:

Articles.	Quantity.	Value.
	<i>Tons.</i>	
Merchandise and products .....	1,723,635	\$25,854,525

*Approximate amount of freight handled by water during the various years.*

Year.	Quantity.	Year.	Quantity.
	<i>Tons.</i>		<i>Tons.</i>
1890 .....	390,207	1899 .....	591,298
1891 .....	319,164	1900 .....	(a)
1892 .....	341,269	1901 .....	940,646
1893 .....	393,352	1902 .....	1,031,598
1894 .....	427,723	1903 .....	1,155,962
1895 .....	455,269	1904 .....	1,404,146
1896 .....	487,004	1905 .....	1,512,798
1898 .....	569,894	1906 .....	1,723,635

(a) No statement.

### L 8.

#### IMPROVEMENT OF WATERWAY FROM NORFOLK, VIRGINIA, TO THE SOUNDS OF NORTH CAROLINA.

During the fiscal year an emergency contract was entered into for dredging in Deep Creek at the northern entrance of the Dismal Swamp Canal. Work was commenced November 5, 1906, and completed November 24, 1906, resulting in the removal of 9,217 cubic yards of material, place measurement, from a cut 3,100 feet long, 60 feet wide, and 10 feet deep. The material was pumped ashore at a price of 29 cents per cubic yard.

The project of this work is considered completed, but maintenance work will be required from time to time to keep the waterway free from obstructions and to maintain the required depth in the approaches to the Dismal Swamp Canal, which forms part of the route.

#### *Money statement.*

July 1, 1906, balance unexpended .....	\$4,415.71
Amount appropriated by river and harbor act approved March 2, 1907 ..	5,000.00
	<hr/> 9,415.71
June 30, 1907, amount expended during fiscal year, for maintenance of improvement .....	4,372.49
	<hr/> 5,043.22
July 1, 1907, balance unexpended .....	
{ Amount that can be profitably expended in fiscal year ending June 30, 1909, for maintenance of improvement, in addition to the balance unexpended July 1, 1907 .....	3,000.00
{ Submitted in compliance with requirements of sundry civil act of June 4, 1897, and of section 7 of the river and harbor act of 1899.	

#### APPROPRIATIONS.

March 3, 1899 .....	\$25,000	March 2, 1907 .....	\$5,000
June 6, 1900 .....	200,000		
March 3, 1901 .....	29,870	Total .....	262,870
March 3, 1905 .....	3,000		

## CONTRACT IN FORCE.

With C. A. Miner, for dredging Deep Creek, Virginia, dated September 24, 1906; date of commencement, October 4, 1906; date of expiration, January 4, 1907. Price, 29 cents per cubic yard, place measurement.

## COMMERCIAL STATISTICS.

The following statistics were compiled from a statement furnished by the Lake Drummond Canal and Water Company, and indicate the traffic through the Dismal Swamp Canal, Virginia and North Carolina, during the calendar year 1906:

Articles.	Quantity.	Value.
	<i>Tons.</i>	
Lumber.....	245,628	\$1,842,210
Miscellaneous.....	142,860	1,802,436
Total.....	388,488	3,644,646

*Vessels.*

Class.	Number.	Average draft.	Average tonnage.
		<i>Feet.</i>	<i>Tons.</i>
Steamers.....	1,733	8	65
Sail.....	780	7	40
Barges and lighters.....	1,452	8½	315
Rafts.....	278		

## L 9.

## IMPROVEMENT OF INLAND ROUTE FROM NORFOLK HARBOR, VIRGINIA, TO ALBERMARLE SOUND, NORTH CAROLINA, THROUGH CURRITUCK SOUND.

The United States snag boat *Roanoke* was employed at various times during the fiscal year on different portions of this route, removing obstructions impeding and endangering navigation. The following is a statement of the obstructions removed from the different sections of the route: From the Southern Branch of the Elizabeth River, 81 logs, 1 iron buoy, parts of boiler and hull of a tugboat; from North Landing River, 490 logs, 30 snags, 1 pile, and 1 piece of square timber; from Currituck Sound, 1 pile; from Coinjock Bay, 55 logs, 2 piles, and 1 stump; and from North River, 548 logs.

A portion of the logs and piles and some rafting gear recovered in the operations of snagging were sold for \$39.25, which sum was deposited to the credit of the appropriation.

The project is considered as completed, but annual operations will be required to keep the route free from obstructions which are constantly developing, due to the traffic in logs and piles.

*Money statement.*

July 1, 1906, balance unexpended.....	\$8,969.86
Amount appropriated by river and harbor act approved March 2, 1907..	3,000.00
Received on account of sales.....	39.25
	<hr/>
	12,009.21
June 30, 1907, amount expended during fiscal year, for maintenance of improvement.....	8,775.30
	<hr/>
July 1, 1907, balance unexpended.....	3,233.91
	<hr/>
{ Amount that can be profitably expended in fiscal year ending June 30, 1909, for maintenance of improvement, in addition to the balance unexpended July 1, 1907.....	5,000.00
{ Submitted in compliance with requirements of sundry civil act of June 4, 1897, and of section 7 of the river and harbor act of 1899.	

## APPROPRIATIONS.

For Southern Branch, Elizabeth River, Virginia :	
March 3, 1873.....	\$15,000
June 23, 1874.....	10,000
March 3, 1875.....	5,000
August 14, 1876.....	5,000
June 18, 1878.....	5,000
	<hr/>
	\$40,000.00
For North Landing River, Virginia and North Carolina :	
March 3, 1879.....	25,000
June 14, 1880.....	15,000
March 3, 1881.....	7,500
August 2, 1882.....	8,000
	<hr/>
	55,000.00
For Currituck Sound, Coinjock Bay, and North River bar, North Carolina :	
June 18, 1878.....	20,000
March 3, 1879.....	25,000
June 14, 1880.....	25,000
March 3, 1881.....	30,000
August 2, 1882.....	20,000
June 5, 1884.....	5,000
August 5, 1886.....	10,000
August 11, 1888.....	7,500
	<hr/>
	142,500.00
For inland water route, etc. :	
September 19, 1890.....	10,000
July 13, 1892.....	8,000
August 18, 1894.....	10,000
June 3, 1896.....	10,000
March 3, 1899.....	8,000
June 13, 1902.....	23,400
March 3, 1905.....	22,000
March 2, 1907.....	3,000
	<hr/>
	95,400.00
Total.....	<hr/>
	333,400.00
Amount received from sale of property.....	2,313.94
	<hr/>
Aggregate.....	335,713.94



## CONTRACT IN FORCE.

With Charles P. Grim, for dredging, dated August 5, 1905; approved August 14, 1905; date of commencement, September 19, 1905; date of expiration, May 19, 1906 (time limit waived). Prices: North river bar, 30 cents; Currituck Sound, 34 cents, and Elizabeth River, 24 cents per cubic yard, scow measurement.

## COMMERCIAL STATISTICS.

The following statistics relative to the commerce of the inland water route from Norfolk Harbor, Virginia, to Albemarle Sound, North Carolina, during the calendar year 1906, were compiled from statements furnished by the Albemarle and Chesapeake Canal Company:

Articles.	Quantity.	Value.
	<i>Tons.</i>	
Lumber, logs, shingles, merchandise, etc.....	100, 000	\$2, 500, 000

*Vessels.*

Class.	Number.	Average draft.	Average tonnage.
		<i>Fect.</i>	<i>Tons.</i>
Steam .....	2, 999	2 to 9	40
Sail .....	414	2 to 9	50
Barges.....	408	2 to 9	174
Rafts .....	266		

*Approximate amount of freight shipped and received by water during various years.*

Year.	Quantity.	Year.	Quantity.
	<i>Tons.</i>		<i>Tons.</i>
1900 .....	196, 958	1904 .....	144, 041
1901 .....	210, 284	1905 .....	88, 580
1902 .....	199, 082	1906 .....	100, 000
1905 .....	203, 612		

## L 10.

## IMPROVEMENT OF PERQUIMANS RIVER, NORTH CAROLINA.

No operations were carried on during the fiscal year and no expenditures were incurred.

The project is considered as having been completed, but work of maintenance will be required from time to time to keep the improvement available.

*Money statement.*

July 1, 1906, balance unexpended.....	\$81. 94
July 1, 1907, balance unexpended.....	81. 94

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## APPROPRIATIONS.

August 14, 1876.....	\$2, 500
March 3, 1905.....	11, 250
Total.....	13, 750

## COMMERCIAL STATISTICS.

The following statistics relative to the commerce of Perquimans River, North Carolina, during the calendar year 1906 were compiled from statements furnished by the shippers making shipments over this stream :

Articles.	Quantity.	Value.
	<i>Tons.</i>	
Logs.....	24, 000	\$120, 000
Lumber.....	81, 250	406, 250
Miscellaneous.....	8, 820	96, 000
Total.....	108, 570	622, 250

*Approximate amount of freight handled by water during various years.*

Year.	Quantity,
	<i>Tons.</i>
1904.....	88, 800
1905.....	50, 375
1906.....	108, 570

## L II.

### IMPROVEMENT OF BLACKWATER RIVER, VIRGINIA.

By act of Congress approved March 2, 1907, a project for clearing this stream of the existing obstructions, so as to afford an easy navigation, was adopted, and the sum of \$8,000 appropriated therefor.

No operations other than the preparation of a project for the expenditure of the appropriation were carried on during the year, and no expenditures were incurred. It is proposed to use the U. S. snag boat *Roanoke* in clearing the stream as soon as her services can be spared for the work. This stream has not been under improvement since 1884.

### *Money statement.*

Amount appropriated by river and harbor act approved March 2, 1907.....	\$8, 000. 00
July 1, 1907, balance unexpended.....	8, 000. 00
Amount that can be profitably expended in fiscal year ending June 30, 1909, for maintenance of improvement, in addition to the balance unexpended July 1, 1907.....	1, 500. 00
Submitted in compliance with requirements of sundry civil act of June 4, 1897, and of section 7 of the river and harbor act of 1899.....	

## APPROPRIATIONS.

June 18, 1878.....	\$5, 000	August 2, 1882.....	\$1, 500
March 3, 1879.....	2, 500	March 2, 1907.....	8, 000
June 14, 1880.....	3, 500		
March 3, 1881.....	1, 500	Total.....	22, 000

## COMMERCIAL STATISTICS.

The following statistics relative to the commerce of Blackwater River, Virginia, during the calendar year 1906 were compiled from statements furnished by the shippers making shipments over this stream:

Articles.	Quantity.	Value.
	Tons.	
Miscellaneous.....	5, 200	\$82, 000

## L 12.

## IMPROVEMENT OF MEHERRIN RIVER, NORTH CAROLINA.

By act of Congress approved March 2, 1907, a project for clearing this stream of existing obstructions so as to afford an easy navigation was adopted, and the sum of \$6,000 appropriated therefor. No operations other than the preparation of a project for the expenditure of the appropriation were carried on during the fiscal year and no expenditures were incurred. It is proposed to use the U. S. snag boat *Roanoke* in clearing the stream as soon as her services can be spared for the work. This stream has not been under improvement since 1886.

*Money statement.*

Amount appropriated by river and harbor act approved March 2, 1907.....	\$8, 000. 00
July 1, 1907, balance unexpended.....	6, 000. 00
Amount that can be profitably expended in fiscal year ending June 30, 1909, for maintenance of improvement, in addition to the balance unexpended July 1, 1907.....	1, 500. 00
Submitted in compliance with requirements of sundry civil act of June 4, 1897, and of section 7 of the river and harbor act of 1899.	

## APPROPRIATIONS.

August 2, 1882.....	\$5, 000
March 2, 1907.....	6, 000
Total.....	11, 000

<sup>a</sup> Of this amount \$415.47 was carried to the surplus fund.

## COMMERCIAL STATISTICS.

The following statistics, relative to the commerce of Meherrin River, North Carolina, during the calendar year 1906, were compiled from statements furnished by the shippers making shipments over this stream :

Articles.	Quantity.	Value.
	<i>Tons.</i>	
Lumber.....	750	\$4,000
Shingles.....	150	1,750
Miscellaneous.....	8,000	80,000
Total.....	8,900	85,750

## L 13.

## IMPROVEMENT OF ROANOKE RIVER, NORTH CAROLINA.

During the fiscal year the U. S. snag boat *Roanoke* was engaged from March 2 to May 22, 1907, in clearing the stream of obstructions. Operations were carried on from the mouth of the river to a point 74 miles above. A total of 39 trees, 10 snags, and 1 stump were removed from the channel and 28 trees overhanging the channel were cut down and the pieces placed on the banks.

All work done during the year was for the purpose of maintaining the channel. The adopted project is about 80 per cent completed, but it is not thought that the present commerce of the river calls for more than the maintenance of the existing channel by the removal of obstructions as they may occur from time to time.

*Money statement.*

July 1, 1906, balance unexpended.....	\$5,162.61
Amount appropriated by river and harbor act approved March 2, 1907.....	3,000.00
	8,162.61
June 30, 1907, amount expended during fiscal year, for maintenance of improvement .....	2,495.30
July 1, 1907, balance unexpended.....	5,667.31
{ Amount that can be profitably expended in fiscal year ending June 30, 1909, for maintenance of improvement, in addition to the balance unexpended July 1, 1907.....	5,000.00
{ Submitted in compliance with requirements of sundry civil act of June 4, 1897, and of section 7 of the river and harbor act of 1899.	

## APPROPRIATIONS.

March 3, 1871.....	\$20,000.00	August 18, 1894.....	\$30,000.00
June 10, 1872.....	10,000.00	June 3, 1896.....	10,000.00
March 3, 1873.....	10,000.00	March 3, 1905.....	10,000.00
June 23, 1874.....	5,000.00	March 2, 1907.....	3,000.00
August 2, 1882.....	5,000.00		
July 5, 1884.....	3,000.00	Total .....	241,000.00
August 5, 1886.....	20,000.00	Amount received from sales of property.....	1,351.75
August 11, 1888.....	40,000.00		
September 19, 1890.....	25,000.00	Aggregate .....	242,351.75
July 13, 1892.....	50,000.00		

## COMMERCIAL STATISTICS.

The following statistics show the commerce of Roanoke River, North Carolina, during the calendar year 1906, and were compiled from statements obtained from the shippers:

Articles.	Quantity.	Value.
	<i>Tons.</i>	
Lumber.....	50,000	\$480,000
Miscellaneous.....	88,508	562,400
Total.....	88,508	1,032,400

*Approximate amount of freight handled by water during the various years.*

Year.	Quantity.	Year.	Quantity.
	<i>Tons.</i>		<i>Tons.</i>
1870.....	150,000	1902.....	163,564
1890.....	182,000	1903.....	115,875
1891.....	376,181	1904.....	32,790
1890.....	27,432	1905.....	(a)
1901.....	226,786	1906.....	88,508

\* Not complete.

## L 14.

## REMOVING SUNKEN VESSELS OR CRAFT OBSTRUCTING OR ENDANGERING NAVIGATION.

*Wreck of steamer Norfolk-on-the-Roads.*—The remaining timbers were removed and placed on shore during the month of July, 1906, at a cost of \$1,000.

*Wreck of schooner Georgia F. Golden.*—The removal of this wreck from Norfolk Harbor was authorized July 10, 1906. The wreck was towed to a marine railway, where it was hauled out and broken to pieces, at a total cost of \$857.66.

*Wreck of barge John R. Zimmerman.*—The barge *John R. Zimmerman*, loaded with brick, filled and sank on the edge of the navigable channel to Norfolk Harbor, off Sewall Point. Its removal was authorized December 7, 1906, at a cost not to exceed \$4,850.

Proposals were invited for destroying the wreck and the work was awarded to the Coastwise Dredging Company, the lowest bidder.

The contractor destroyed the wreck by the use of explosives in December, 1906. The total cost of the work was \$4,850.

*Wreck of schooner Three Sisters.*—This vessel sank in Hampton Creek, Virginia, between the established bulkhead and pierhead lines. Its removal was authorized May 3, 1907, at a cost not to exceed \$500.

Proposals were invited for destroying the wreck and the work was awarded to the Coastwise Dredging Company, the lowest bidder.

The contractor destroyed the wreck by the use of explosives in May, 1907. The total cost of the work was \$500.

*Wreck of barge (name unknown).*—This barge sank in Smith Creek, an arm of Norfolk Harbor. Its removal was authorized June 10, 1907. Arrangements will be made for raising the wreck early in the fiscal year 1908.



## APPENDIX M.

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### IMPROVEMENT OF CERTAIN RIVERS AND HARBORS IN NORTH CAROLINA.

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*REPORT OF CAPT. EARL I. BROWN, CORPS OF ENGINEERS, OFFICER IN CHARGE, FOR THE FISCAL YEAR ENDING JUNE 30, 1907.*

#### IMPROVEMENTS.

- |  |  |
|--|--|
| 1. Scuppernong River, North Carolina.                                    | 8. Harbor at Beaufort, North Carolina.   |
| 2. Fishing Creek, North Carolina.  | 9. Beaufort Inlet, North Carolina.   |
| 3. Pamlico and Tar rivers, North Carolina.                               | 10. New River, including inland waterways between Beaufort Harbor and New River and between New River and Swansboro, North Carolina. |
| 4. Contentnea Creek, North Carolina.                                     | 11. Northeast (Cape Fear) and Black rivers, and Cape Fear River above Wilmington, North Carolina.                                    |
| 5. Neuse and Trent rivers, North Carolina.                               | 12. Cape Fear River, North Carolina, at and below Wilmington.  |
| 6. Inland waterway from Pamlico Sound to Beaufort Inlet, North Carolina. | 13. Shallotte River, North Carolina.   |
| 7. Inland Waterway. between Newbern and Beaufort, North Carolina.        |  |

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UNITED STATES ENGINEER OFFICE,  
*Wilmington, N. C., July 9, 1907.*

GENERAL: In compliance with General Orders, No. 2, April 25, 1907, I have the honor to forward the annual reports for the Wilmington, N. C., district for the fiscal year 1907. \* \* \*

Very respectfully, your obedient servant,

EARL I. BROWN,  
*Captain, Corps of Engineers.*

Brig. Gen. A. MACKENZIE,  
*Chief of Engineers, U. S. A.*

## M 1.

## IMPROVEMENT OF SCUPPERNONG RIVER, NORTH CAROLINA.

*Reference.*—See page 263 of current summary.

The dredge *Scuppernong* and plant becoming available, active work of dredging was commenced on the cut across the bar at the mouth of the river on December 28, 1906, and suspended on February 11, 1907, for lack of funds.

During that time a cut 1,100 feet long, 80 feet wide, and 9 feet deep at mean low water was dredged through a shoal which had formed in the cut previously made at this point, and on the work of widening the channel previously dredged a cut 700 feet long, 40 feet wide, and 9 feet deep at mean low water was dredged. There were removed from the former 18,828 cubic yards of material for maintenance and from the latter 5,899 cubic yards of material for improvement, making a total of 24,727 cubic yards.

The liabilities incurred on this improvement during the year amounted to \$4,649.24, making the cost of the dredging 18.8+ cents per cubic yard. Of the above amount \$1,179.27 was for improvement and \$3,469.97 for maintenance.

An additional appropriation of \$5,000 is recommended, of which \$2,500 is for completion of project and \$2,500 for maintenance.

*Money statement.*

July 1, 1906, balance unexpended.....	\$4, 679. 27
Amount appropriated by river and harbor act approved March 2, 1907.....	2, 000. 00
	<u>6, 679. 27</u>
June 30, 1907, amount expended during fiscal year:	
For works of improvement.....	\$3, 469. 97
For maintenance of improvement.....	1, 179. 27
	<u>4, 649. 24</u>
July 1, 1907, balance unexpended.....	2, 030. 03
Amount (estimated) required for completion of existing project.....	2, 500. 00
	<u><u>4, 530. 03</u></u>
Amount that can be profitably expended in fiscal year ending June 30, 1909, in addition to the balance unexpended July 1, 1907:	
For works of improvement.....	\$2, 500. 00
For maintenance of improvement.....	2, 500. 00
	<u>5, 000. 00</u>
Submitted in compliance with requirements of sundry civil act of June 4, 1897, and of section 7 of the river and harbor act of 1899.	

## APPROPRIATIONS.

Prior to 1887.....	\$8, 000
June 13, 1902.....	10, 000
March 3, 1905.....	5, 000
March 2, 1907.....	2, 000
	<u>25, 000</u>
Total appropriated .....	25, 000



## COMMERCIAL STATISTICS FOR YEAR ENDING DECEMBER 31, 1906.

Class of goods.	Tons.	Price.	Value.
Cotton.....	711	\$210	\$149,310
Grains.....	169	35	5,915
Hay.....	80	20	1,600
Potatoes.....	1,848	20	36,960
Vegetables.....	16	20	320
Cattle.....	67	60	4,020
Horses.....	10	100	1,000
Hogs.....	194	100	19,400
Poultry.....	50	200	10,000
Eggs.....	105	300	31,500
Fish.....	58	60	3,480
Wood.....	75	4	300
Timber.....	8,662	7	25,634
Lumber.....	12,660	10	126,600
Fertilizer.....	2,348	22	51,656
General merchandise.....	7,414	140	1,037,960
Coal.....	400	5	2,000
Peanuts.....	47	60	2,820
Cooper logs.....	15,000	5	75,000
Total.....	44,909	.....	1,685,176

Number of passengers (estimated), 6,697.

Loss in volume since last year, 10,228 tons.

No transportation lines established during the year.

*Statement of vessels navigating Scuppernong River, North Carolina, during the calendar year ending December 31, 1906.*

Class of vessel.	Number.	Aggregate net tonnage.	Draft.
Steamers.....	25	1,250	<i>Feet.</i> 4 to 8
Barges.....	11	2,145	5 to 7

## M 2.

## IMPROVEMENT OF FISHING CREEK, NORTH CAROLINA.

*Reference.*—See page 264 of current summary.

No active operations were carried on during the year.

It is proposed to apply the small available balance to the maintenance of the natural channel as far as Beech Swamp. No additional appropriations are recommended at present, since the stream is not now considered worthy of further improvement, nor even of maintenance.

*Money statement.*

July 1, 1906, balance unexpended.....	\$356. 20
July 1, 1907, balance unexpended.....	356. 20

## APPROPRIATIONS.

September 19, 1890.....	\$10,000	March 3, 1905.....	\$500
July 13, 1892.....	5,000		
March 3, 1899.....	7,750	Total.....	25,250
June 13, 1902.....	2,000		

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## COMMERCIAL STATISTICS FOR THE YEAR ENDING DECEMBER 31, 1906.

Class of goods.	Tons.	Price.	Value.
Cotton seed .....	442	\$20	\$8,840
Cotton-seed meal.....	287	25	5,925
Cotton-seed hulls.....	8	18	54
Timber.....	1,250	7	8,750
Fertilizer.....	319	22	7,018
Total .....	2,251	.....	30,587

Loss in volume since last year of 55 tons.

No transportation lines established during the year.

*Statement of vessels navigating Fishing Creek, North Carolina, during the calendar year 1906.*

Class of vessel.	Number.	Aggregate net tonnage.	Draft.
Naphtha launches .....	2	25	Feet. 2

## M 3.

## IMPROVEMENT OF PAMLICO AND TAR RIVERS, NORTH CAROLINA.

[One river called Pamlico below and Tar above Washington.]

*Reference.*—See page 265 of current summary.

No work has been done on the project as modified in 1907.

The Government dredge *Scuppernong*, operated by hired labor, commenced work on the cut below Washington on February 20 and was still at work at this point at the close of the year. The dredge removed from a cut 6,216 feet long, 100 feet wide, and 9 feet deep, at mean low water, 129,307 cubic yards of material, 62 logs, and 247 stumps. No work was done above Washington.

The expenditures during the fiscal year were \$7,375.64, adding \$2,333.07 outstanding at the end of the year 1907 (there being no liabilities outstanding June 30, 1906), the total cost of the year's work is found to be \$9,708.71, all of which is for improvement. This sum is made up as follows:

Operating dredge <i>Scuppernong</i> .....	\$3,804.23
Operating steamer <i>Thom</i> .....	3,848.30
Rent of yard at Newbern.....	175.00
Dynamite and fuses.....	157.60
Rent of tug.....	328.50
Repairs to mud scows.....	62.23
Care of plant.....	150.50
Superintendence and survey.....	527.33
Main office expenses.....	655.02
Total.....	9,708.71

making the cost of dredging 7.5 — cents per cubic yard, allowing nothing for the cost of removing logs and stumps.

It is proposed to apply the available balance, together with additional appropriation recommended, toward completing the channel below Washington and completing the 4-foot channel between Washington and Greenville, and for maintenance both above and below Washington.

*Money statement.*

July 1, 1906, balance unexpended.....	\$4, 254. 06
Amount appropriated by river and harbor act approved March 2, 1907.....	11, 563. 00
	15, 817. 06
June 30, 1907, amount expended during fiscal year, for works of improvement .....	7, 375. 64
July 1, 1907, balance unexpended.....	8, 441. 42
July 1, 1907, outstanding liabilities.....	2, 333. 07
July 1, 1907, balance available.....	6, 108. 35

{	Amount that can be profitably expended in fiscal year ending June 30, 1909, for maintenance of improvement, in addition to the balance unexpended July 1, 1907.....	10, 000. 00
	Submitted in compliance with requirements of sundry civil act of June 4, 1897, and of section 7 of the river and harbor act of 1899.	

APPROPRIATIONS.

Date.	Amount.	Aggregate.	Date,	Amount.	Aggregate.
July 4, 1836 to July 7, 1838.....	\$10,000. 00	\$10,000. 00	September 19, 1890.....	\$10,000. 00	\$78,000. 00
August 14, 1876.....	15,000. 00	15,000. 00	July 13, 1892.....	10,000. 00	88,000. 00
May 3, 1879.....	6,000. 00	21,000. 00	August 18, 1894.....	10,000. 00	98,000. 00
June 14, 1880.....	9,000. 00	30,000. 00	June 3, 1896.....	5,000. 00	103,000. 00
March 3, 1891.....	8,000. 00	38,000. 00	March 3, 1899.....	15,000. 00	118,000. 00
August 2, 1892.....	10,000. 00	48,000. 00	June 13, 1902.....	25,500. 00	153,500. 00
July 5, 1894.....	5,000. 00	53,000. 00	March 3, 1905.....	8,000. 00	161,500. 00
August 5, 1896.....	5,000. 00	58,000. 00	March 2, 1907.....	11,563. 00	173,063. 00
August 11, 1898.....	10,000. 00	68,000. 00	Sales.....	172. 66	173,235. 66

COMMERCIAL STATISTICS FOR CALENDAR YEAR ENDING DECEMBER 31, 1906.

Class of goods.	Tons.	Price.	Value.
Cotton.....	14,344	\$210	\$3,012,240
Cotton seed.....	11,118	25	277,950
Cotton-seed oil.....	1,400	140	196,000
Cotton-seed meal.....	3,987	25	99,425
Tobacco, leaf.....	1,067	200	213,400
Rice, rough.....	40	50	2,000
Grains.....	8,562	35	124,670
Hay.....	8,116	20	162,320
Potatoes.....	8,085	20	161,700
Vegetables.....	2,263	20	45,260
Cattle.....	145	60	8,700
Horses.....	55	100	5,500
Hogs.....	20	100	2,000
Poultry.....	83	200	6,600
Eggs.....	164	300	49,200
Fish.....	3,054	60	183,240
Oysters.....	2,825	35	98,875
Clams.....	5,000	50	250,000
Roan.....	600	28	16,800

## 1226 REPORT OF THE CHIEF OF ENGINEERS, U. S. ARMY.

## COMMERCIAL STATISTICS FOR CALENDAR YEAR, ETC.—Continued.

Class of goods.	Tons.	Price.	Value.
Turpentine:			
Crude .....	50	\$30	\$1,500
Spirits .....	200	145	29,000
Wood .....	5,037	4	20,148
Timber .....	110,586	7	774,095
Lumber .....	161,606	10	1,616,060
Shingles .....	4,322	8	34,576
Fertilizer .....	19,568	22	430,276
Machinery .....	785	100	78,500
General merchandise .....	86,813	140	12,153,820
Staves .....	24,000	.....	720,000
Coal .....	5,641	5	28,205
Stone .....	1,012	5	5,060
Tar .....	25	12	300
Peanuts .....	54	60	3,240
Brick .....	738	3	2,214
Shells .....	4,680	1.5	7,020
Piles .....	500	5	2,500
Total .....	491,384	.....	20,816,394

Loss in volume since last year, 75,947 tons.

Transportation lines established during the year, none.

Number of passengers handled, 16,471.

*Statement of vessels navigating Pamlico and Tar rivers, North Carolina, for calendar year ending December 31, 1906.*

Class of vessel.	Number.	Aggregate net tonnage.	Draft.
			<i>Feet.</i>
Steamers .....	20	645	8 to 8
Schooners .....	87	1,004	2 to 8
Launches .....	28	186	2 to 4
Barges .....	50	1,500	5 to 8

## M 4.

## IMPROVEMENT OF CONTENTNIA CREEK, NORTH CAROLINA.

*Reference.*—See page 267, current summary.

The work of the past year has been exclusively that of maintenance between the mouth and the thirty-second milepost. Work was commenced in April, 1907, and ceased in May, 1907. There were removed from the channel  $2\frac{1}{2}$  cords of brush,  $3\frac{1}{2}$  cords of small snags, 71 large snags, 39 stumps, 16 logs, and 44 trees. From the banks 64 trees were cut and hauled back, 2 trees trimmed, one-half cord small snags removed, and three-quarters cord brush cut, all at a cost of \$955.85. The stream is in good condition.

It is proposed to apply the available balance to maintenance of the channel between the mouth of the creek and Snow Hill. Interested parties have expressed a desire to have the maintenance extended to Speight's bridge, but it is doubtful if boats would use that portion of the stream if improved.

Additional appropriations of \$2,000 annually are recommended for maintenance.

*Money statement.*

July 1, 1906, balance unexpended.....	\$897. 94
Amount appropriated by river and harbor act approved March 2, 1907.....	2, 000. 00
	<u>2, 897. 94</u>
June 30, 1907, amount expended during fiscal year, for maintenance of improvement.....	953. 10
July 1, 1907, balance unexpended.....	1, 944. 84
July 1, 1907, outstanding liabilities.....	2. 75
July 1, 1907, balance available.....	<u>1, 942. 09</u>
Amount that can be profitably expended in fiscal year ending June 30, 1908, for maintenance of improvement, in addition to the balance unexpended July 1, 1907.....	
Submitted in compliance with requirements of sundry civil act of June 4, 1897, and of section 7 of the river and harbor act of 1899.	
	2, 000. 00

## APPROPRIATIONS.

Date.	Amount.	Aggregate.	Date.	Amount.	Aggregate.
March 3, 1881.....	\$10, 000	\$10, 000	Allotted January 27, 1905, from emergency appropriation, act of April 28, 1904.....	\$500	\$72, 000
August 2, 1882.....	10, 000	20, 000	March 3, 1906.....	1, 000	73, 000
July 5, 1884.....	5, 000	25, 000	March 2, 1907.....	2, 000	75, 000
August 5, 1886.....	15, 000	40, 000	Sales.....	177	75, 177
August 11, 1886.....	5, 000	45, 000			
September 19, 18..0.....	7, 000	52, 000			
July 13, 1892.....	7, 000	59, 000			
August 18, 1894.....	10, 000	69, 000			
March 3, 1899.....	2, 000	71, 000			
Allotted from emergency appropriation, act of June 13, 1902.....	500	71, 500			

## COMMERCIAL STATISTICS FOR THE YEAR ENDING DECEMBER 31, 1906.

Class of goods.	Tons.	Unit price.	Value.
Cotton.....	475	\$210	\$99, 750
Cotton-seed.....	500	20	10, 000
Cotton-seed meal.....	200	25	5, 000
Grains.....	180	85	4, 560
Hay.....	225	20	4, 500
Timber.....	9, 750	7	68, 250
Fertilizer.....	9, 616	22	211, 552
General merchandise.....	1, 110	145	160, 950
Coal.....	100	5	500
Totals.....	22, 106		565, 052

Gain over last year 276 tons.

Transportation lines established during the year, none.

*Statement of vessels navigating Contentnia Creek, North Carolina, during calendar year ending December 31, 1906.*

Class of vessel.	Number.	Aggregate net tonnage.	Draft.
Steamers.....	10	886	Fect. 2 to 5

## M 5.

## IMPROVEMENT OF NEUSE AND TRENT RIVERS, NORTH CAROLINA.

## (A) NEUSE RIVER.

*Reference.*—See page 268, current summary.

The work for the year consisted of dredging at Union Point Shoal, which is just below Newbern. Between September 24 and November 28 there were removed from this shoal, by the Government dredge *Scuppernong*, operated by hired labor, 44,397 cubic yards of material, 23 logs, and 216 stumps, completing the channel to the project width of 300 feet and 8 feet depth at dead low water.

The cost of this year's work was \$4,895.05, or 11+ cents per cubic yard, no account being taken of the logs and stumps removed. All of the expenditures were for improvement.

*Money statement.*

July 1, 1906, balance unexpended.....	\$5, 067. 25
Amount appropriated by river and harbor act approved	
March 2, 1907.....	\$18, 000. 00
Amount received from sales, rents, etc.....	47. 20
	<hr/> 18, 047. 20
	23, 114. 45
June 30, 1907, amount expended during fiscal year for works of improvement.....	4, 921. 55
July 1, 1907, balance unexpended.....	18, 192. 90
Amount (estimated) required for completion of existing project....	<hr/> 72, 500. 00
Amount that can be profitably expended in fiscal year ending June 30, 1909, in addition to the balance unexpended July 1, 1907:	
For works of improvement.....	\$10, 000. 00
For maintenance of improvement.....	7, 500. 00
	<hr/> 17, 500. 00
Submitted in compliance with requirements of sundry civil act of June 4, 1907, and of section 7 of the river and harbor act of 1899.	

## APPROPRIATIONS.

Date.	Amount.	Aggregate.	Date.	Amount.	Aggregate.
June 18, 1878.....	\$40, 000. 00	\$40, 000. 00	June 13, 1902.....	<sup>a</sup> \$13,500. 00	\$320, 000. 00
March 3, 1879.....	45, 000. 00	85, 000. 00	Allotted from appropriation for emergencies in river and harbor works, act June 13, 1902.	2, 000. 00	322, 000. 00
June 14, 1880.....	45, 000. 00	130, 000. 00	Allotted from appropriation for emergencies in river and harbor works, act April 28, 1904.	500. 00	322, 500. 00
March 3, 1881.....	30, 000. 00	160, 000. 00	March 3, 1905.....	<sup>a</sup> 17, 000. 00	339, 500. 00
August 2, 1882.....	80, 000. 00	190, 000. 00	March 2, 1907.....	<sup>a</sup> 18, 000. 00	357, 500. 00
July 5, 1884.....	20, 000. 00	210, 000. 00	Sales.....	219. 10	357, 719. 10
August 11, 1888.....	15, 000. 00	247, 500. 00			
September 30, 1890.....	20, 000. 00	267, 500. 00			
July 18, 1892.....	15, 000. 00	282, 500. 00			
August 18, 1894.....	7, 000. 00	289, 500. 00			
June 3, 1896.....	7, 000. 00	296, 500. 00			
March 3, 1899.....	10, 000. 00	306, 500. 00			

<sup>a</sup> Allotted from combined appropriation for Neuse and Trent rivers, North Carolina.

## COMMERCIAL STATISTICS FOR THE YEAR ENDING DECEMBER 31, 1906.

Class of goods.	Tons.	Unit Price.	Value.
Cotton.....	10,289	\$210	\$2,160,690
Cotton seed.....	3,920	20	78,400
Cotton-seed meal.....	1,795	25	44,875
Grains.....	17,358	35	607,355
Hay.....	4,570	20	91,400
Potatoes.....	3,615	20	72,300
Vegetables.....	2,825	20	56,500
Cattle.....	25	60	1,500
Horses.....	50	100	5,000
Hogs.....	20	100	2,000
Poultry.....	15	200	3,000
Eggs.....	75	300	22,500
Fish.....	1,450	60	87,000
Oysters.....	2,800	35	98,000
Clams.....	5,000	50	250,000
Rosin.....	1,600	25	40,000
Turpentine:			
Crude.....	50	28	1,400
Spirits.....	562	145	81,490
Wood.....	3,500	4	14,000
Timber.....	110,000	7	770,000
Lumber.....	205,000	10	2,050,000
Shingles.....	2,900	8	23,200
Fertilizer.....	41,500	22	913,000
Machinery.....	850	100	85,000
General merchandise.....	74,450	140	10,423,000
Coal.....	6,375	5	31,875
Tar.....	22	15	330
Peanuts.....	4	60	240
Brick.....	1,200	3	3,600
Total.....	501,315		\$17,967,655

Estimated number of passengers carried, 20,000.

No transportation lines established during the year.

*Statement of vessels navigating Neuse River, North Carolina, for the calendar year ending December 31, 1906.*

Class of vessel.	Number.	Aggregate net tonnage.	Draft.
			<i>Feet.</i>
Steamers.....	40	2,400	2 to 8
Schooners, sloops, etc.....	185	4,625	2 to 8
Naphtha launches.....	40	225	2 to 4
Barges.....	41	12,300	6 to 8

## (B) TRENT RIVER.

*Reference.*—See page 270 of current summary.

The work of improvement, which consisted of removing the shoal between the main channel and the harbor line at Newbern to a depth of 8 feet at dead low water, in progress at the beginning of the year, was completed on September 24. There were removed from this shoal during the year 39,003 cubic yards of extremely hard clay and mud, 42 logs, and 141 large stumps. This work was done by the Government dredge *Scuppernon*, operated by hired labor. The stumps and logs were removed at irregular times during the progress of the dredging, and the cost of their removal can not be accurately stated; but if their removal be considered incidental to the dredging and the total cost charged to dredging, it will make the cost of the dredging 9 cents per cubic yard. If an equitable proportion of the cost be

charged to logs and stumps, the cost of the dredging per cubic yard would be very much reduced.

The work of maintenance consisted of removing from the channel between Newbern and Trenton 43 large snags, 11 stumps, 77 logs, and 19 trees; from the banks between the same points 26 trees and 7½ cords of brush were cut and hauled back, and from the turning basin at Trenton 433 cubic yards of sand were removed. This work was done between November 19 and December 12 by the Government snag boat *Trent*, operated by hired labor.

The liabilities incurred during the year have been \$3,522.43 for improvement and \$883.32 for maintenance; total, \$4,405.75.

The project is completed, excepting that portion inserted in compliance with Public Resolution No. 22, approved March 4, 1907, authorizing a channel 6 feet deep over Foys flats, about 4 miles above Newbern.

It is thought that the available balance will be sufficient to complete the project, and an additional annual appropriation of \$2,500 is recommended for maintenance.

#### Money statement.

July 1, 1906, balance unexpended.....	\$5,999.17
Amount appropriated by river and harbor act approved March 2, 1907.....	12,000.00
	17,999.17
June 30, 1907, amount expended during fiscal year:	
For works of improvement.....	\$5,000.00
For maintenance of improvement.....	883.32
	5,883.32
July 1, 1907, balance unexpended.....	12,115.85
July 1, 1907, outstanding liabilities.....	65.00
July 1, 1907, balance available.....	12,050.85
<p>{ Amount that can be profitably expended in fiscal year ending June 30, 1909, for maintenance of improvement, in addition to the balance unexpended July 1, 1907.....</p> <p>Submitted in compliance with requirements of sundry civil act of June 4, 1897, and of section 7 of the river and harbor act of 1899.</p>	
	2,500.00

#### APPROPRIATIONS.

Date.	Amount.	Aggregate.	Date.	Amount.	Aggregate.
March 3, 1879.....	\$7,000.00	\$7,000.00	June 3, 1896.....	\$2,000.00	\$66,500.00
June 14, 1880.....	10,000.00	17,000.00	March 3, 1899.....	2,500.00	69,000.00
March 3, 1881.....	5,000.00	22,000.00	June 13, 1902.....	6,500.00	75,500.00
August 2, 1882.....	10,000.00	32,000.00	Allotted from appropriation for emergencies in river and harbor works, act June 13, 1902.	1,000.00	76,500.00
July 5, 1884.....	10,000.00	42,000.00	March 3, 1905.....	23,000.00	99,500.00
August 5, 1886.....	3,500.00	45,500.00	March 2, 1907.....	12,000.00	111,500.00
August 11, 1888.....	5,000.00	50,500.00	Sales.....	348.90	111,848.90
September 19, 1890.....	5,000.00	55,500.00			
July 13, 1892.....	5,000.00	60,500.00			
August 18, 1894.....	4,000.00	64,500.00			

\* Allotted from combined appropriation for Neuse and Trent rivers, North Carolina.



## COMMERCIAL STATISTICS FOR THE YEAR ENDING DECEMBER 31, 1906.

Class of goods.	Tons.	Unit price.	Value.
Cotton.....	8,400	\$210	\$1,764,000
Cotton seed.....	1,660	20	33,200
Cotton-seed meal.....	975	25	24,375
Tobacco, leaf.....	1,000	200	200,000
Grains.....	16,668	35	484,430
Hay.....	4,490	20	89,800
Potatoes.....	4,176	20	83,520
Vegetables.....	8,068	20	61,360
Cattle.....	51	60	3,060
Horses.....	51	100	5,100
Hogs.....	11	100	1,100
Poultry.....	2	200	400
Eggs.....	76	300	22,800
Fish.....	750	60	45,000
Oysters.....	915	35	32,025
Clams.....	5,000	50	250,000
Rosin.....	1,399	20	27,780
Turpentine, crude.....	50	30	1,500
Turpentine, spirits.....	562	140	78,680
Wood.....	2,750	3	8,250
Timber.....	102,425	6	614,550
Lumber.....	99,600	10	996,000
Shingles.....	270	8	2,160
Fertilizers.....	10,450	22	229,900
Machinery.....	350	100	35,000
General merchandise.....	73,498	140	10,289,920
Coal and minerals.....	3,619	5	18,095
Tar.....	22	12	264
Peanuts.....	4	60	240
Baffing gear.....	680	80	52,800
Brick.....	510	300	1,530
Total.....	343,507		15,456,539

Gain over last year, 81,372 tons.

Transportation lines established during the year, none.

Number of passengers, 20,898.

*Statement of vessels navigating Trent River, North Carolina, during calendar year ending December 31, 1906.*

Class of vessel.	Number.	Aggregate net tonnage.	Draft.
Steamers.....	30	1,950	2 to 8
Barges.....	26	5,280	6 to 8
Launches.....	25	150	2 to 4
Schooners, sloops, etc.....	150	3,900	2 to 8

## M 6.

INLAND WATERWAY FROM PAMLICO SOUND TO BEAUFORT INLET,  
NORTH CAROLINA.

*Reference.*—See page 271 of current summary.

The only work done during the year was prosecuting a survey for the purpose of definitely locating the route of the proposed canal. The survey was started on May 6, and is still in progress. The field work is about half completed, and has cost to June 30, including main office expenses, \$1,773.31.

*Money statement.*

Amount appropriated by river and harbor act approved March 2, 1907	\$200, 000. 00
June 30, 1907, amount expended during fiscal year, for works of improvement .....	924. 91
July 1, 1907, balance unexpended .....	199, 075. 09
July 1, 1907, outstanding liabilities .....	848. 40
July 1, 1907, balance available .....	198, 226. 69
Amount (estimated) required for completion of existing project .....	<sup>a</sup> 350, 000. 00
Amount that can be profitably expended in fiscal year ending June 30, 1909, for works of improvement, in addition to the balance unexpended July 1, 1907 .....	
<sup>b</sup> 350, 000. 00	
Submitted in compliance with requirements of sundry civil act of June 4, 1897.	

## APPROPRIATIONS.

Date.	Amount.	Aggregate.
March 2, 1907 .....	\$200, 000	\$200, 000

## M 7.

## IMPROVEMENT OF WATERWAY BETWEEN NEWBERN AND BEAUFORT, NORTH CAROLINA.

*Reference.*—See page 272 of current summary.

Plant becoming available, work was commenced on December 20, 1906, and ceased on January 2, 1907.

Work was carried on near the head of Clubfoot Creek. There were removed 2,758 cubic yards of material and one log from a cut 1,100 feet long, 5 feet deep, and 25 feet wide, at a cost of \$403.53.

The canal connecting the head of Clubfoot Creek (which empties into the Neuse) with the head of Harlowe Creek (which empties into the Newport River) is owned by a corporation, which does very little, if anything, in the way of maintenance. The United States makes no expenditures on this canal and makes no effort to keep the rest of the waterway in better condition than the canal itself.

*Money statement.*

July 1, 1906, balance unexpended .....	\$464. 45
Amount appropriated by river and harbor act approved March 2, 1907 .....	2, 000. 00
	2, 464. 45
June 30, 1907, amount expended during fiscal year, for works of improvement .....	432. 85
July 1, 1907, balance unexpended .....	2, 031. 60
Amount (estimated) required for completion of existing project .....	55, 000. 00

## APPROPRIATIONS.

Date.	Amount.	Aggregate.
August 2, 1882 .....	\$10, 000	\$10, 000
August 6, 1886 .....	10, 000	20, 000
August 11, 1888 .....	15, 000	35, 000
March 2, 1907 .....	2, 000	37, 000

<sup>a</sup> Provided for in river and harbor act March 2, 1907, for continuing contract work, etc.

<sup>b</sup> Sundry civil bill.

## COMMERCIAL STATISTICS FOR THE YEAR ENDING DECEMBER 31, 1906.

Class of goods.	Tons.	Unit price.	Value.
Cotton .....	218	\$210	\$44,780
Cotton seed .....	850	20	17,000
Cotton-seed meal .....	250	25	6,250
Cotton-seed hulls .....	148	18	2,664
Grains .....	225	35	7,875
Hay .....	150	20	3,000
Potatoes .....	148	20	2,960
Vegetables .....	185	20	3,700
Cattle .....	5	60	300
Hogs .....	6	100	600
Poultry .....	2	200	400
Eggs .....	1	800	800
Fish .....	267	60	16,020
Oysters .....	3,000	35	105,000
Clams .....	1,200	50	60,000
Rosin .....	625	25	15,625
Turpentine, spirits .....	250	145	36,250
Wood .....	6,430	4	25,720
Timber .....	26,750	7	187,250
Lumber .....	29,200	10	292,000
Shingles .....	20	8	160
Fertilizer .....	2,500	22	55,000
Machinery .....	25	100	2,500
General merchandise .....	9,200	140	1,288,000
Coal .....	120	5	600
Total .....	81,770	.....	2,178,904

Loss since last year of 1,897 tons; no transportation lines established during the year.

*Statement of vessels navigating waterway between Newbern and Beaufort, N. C., for the calendar year ending December 31, 1906.*

Class of vessel.	Number.	Aggregate net tonnage.	Draft.
Naphtha launches .....	20	180	<i>Feet.</i> 2 to 4
Steamers .....	7	210	4 to 6
Schooners, sloops, etc. ....	85	2,200	2 to 4
Barges .....	6	1,200	5 to 7

## M 8.

## IMPROVEMENT OF HARBOR AT BEAUFORT, NORTH CAROLINA.

*Reference.*—See page 273 of current summary.

Early in the month of December, 1906, the shore end of the inner or western spur jetty at Fort Macon Point was undermined and the jetty flanked, and the stability of Fort Macon Point threatened as a result of the damage.

Since December the shore line at Fort Macon Point has been resurveyed and current observations and soundings taken in that vicinity. These surveys show that the ebb current makes an angle with the general trend of the shore line at the point where the damage occurred, and that considerable scour of the bottom and erosion of the shore was taking place in that vicinity. The unfavorable influence of the old jetty was plainly shown by the division of the ebb flow around its ends and the scour just below.

As a matter of relief, it was decided to remove the remains of the old jetty, and with the stone so removed and additional stone to be purchased build other spur jetties in that vicinity.

The Government snag boat *Trent*, with hired labor, started this work on May 18, and the work was still in progress on June 30. To June 30, 383.83 tons of stone had been removed from the old jetty and 303.83 tons of it used in the construction of two other jetties; 65.6 cords of brush were cut and made into fascine mattresses and 44.6 cords of it used in the two jetties, leaving 80 tons of stone and 21 cords of brush that has not yet been placed in the new jetties. The two jetties were started near the high-water line, and have been completed to the 6-foot contour, their present lengths being 90 and 91 feet.

It is also the intention to construct a third short jetty, similar to the two already started. After this jetty has been completed out to the 6-foot contour and the remains of the old jetty has been entirely removed, the effect upon the shore line and vicinity will be carefully observed before these jetties are extended or others built.

The liabilities incurred during the year, all for maintenance, amount to \$2,203.41, of which \$1,264.19 was outstanding at the end of the year.

It is proposed to spend the available balance and the additional appropriation recommended in redredging channel across Bulkhead shoal, maintaining sand fences at Fort Macon and Shackleford points, completing the removal of the old jetty, and constructing new jetties at Fort Macon Point.

#### Money statement.

July 1, 1906, balance unexpended.....	\$196. 03
Amount appropriated by river and harbor act approved March 2, 1907.....	22, 000. 00
	<hr/> 22, 196. 03
June 30, 1907, amount expended during fiscal year, for maintenance of improvement.....	939. 22
	<hr/> 21, 256. 81
July 1, 1907, balance unexpended.....	21, 256. 81
July 1, 1907, outstanding liabilities.....	1, 264. 19
	<hr/> 19, 992. 62
Amount that can be profitably expended in fiscal year ending June 30, 1909, for maintenance of improvement, in addition to the balance unexpended July 1, 1907.....	5, 000. 00
Submitted in compliance with requirements of sundry civil act of June 4, 1897, and of section 7 of the river and harbor act of 1899.	

#### APPROPRIATIONS.

Date.	Amount.	Aggregate.	Date.	Amount.	Aggregate.
July 4, 1886.....	\$5, 000	\$5, 000	June 18, 1902.....	\$3, 000	\$158, 000
March 5, 1890.....	80, 000	80, 000	Allotted from appropriation for emergencies in river and harbor works, act April 28, 1904.....	1, 000	159, 000
August 2, 1892.....	25, 000	55, 000	March 5, 1905.....	2, 000	161, 000
July 5, 1894.....	20, 000	75, 000	March 2, 1907.....	24, 000	183, 000
August 5, 1896.....	15, 000	90, 000	Sales.....	350	183, 350
August 11, 1898.....	85, 000	125, 000			
September 19, 1899.....	15, 000	140, 000			
July 15, 1892.....	10, 000	150, 000			
June 8, 1896.....	5, 000	155, 000			

## COMMERCIAL STATISTICS FOR THE YEAR ENDING DECEMBER 31, 1906.

Class of goods.	Tons.	Unit price.	Value.
Cotton.....	248	\$210	\$52,080
Cotton seed.....	840	20	16,800
Cotton-seed meal.....	800	25	7,500
Grains.....	30	35	1,050
Hay.....	175	20	3,500
Potatoes.....	369	20	7,380
Vegetables.....	260	20	5,200
Cattle.....	10	60	600
Hogs.....	5	100	500
Poultry.....	5	200	1,000
Eggs.....	6	300	1,800
Fish.....	5,954	60	357,240
Oysters.....	7,993	35	279,755
Clams.....	5,665	50	283,250
Rosin.....	625	25	15,625
Turpentine, spirits.....	250	145	36,250
Wood.....	4,230	4	16,920
Lumber.....	8,666	10	86,660
Shingles.....	30	5	150
Fertilizer.....	1,815	22	39,930
Machinery.....	11	25	275
General merchandise.....	19,602	140	2,744,280
Coal.....	120	5	600
Soft crabs.....	40	120	4,800
Pine piles.....	1,375	5	6,875
Brick.....	275	3	825
Total.....	58,889	.....	3,970,855

## Statement of vessels navigating Beaufort Harbor, North Carolina, during the calendar year 1906.

Class of vessel.	Number.	Aggregate net tonnage.	Draft.
Steamers.....	75	3,000	<i>Fect.</i> 3 to 10
Schooners, sloops, etc.....	300	10,000	2 to 10
Launches and yachts.....	210	2,200	2 to 8

## M 9.

## IMPROVEMENT OF BEAUFORT INLET, NORTH CAROLINA.

*Reference.*—See page 275, current summary.

The suction dredge *Cape Fear*, belonging to Cape Fear River, at and below Wilmington, N. C., which was at work on this improvement at the beginning of the fiscal year, continued working until December 14, when an accident to her stern bearing made it necessary for the dredge to go to Norfolk, Va., for repairs. She returned to Beaufort Inlet and resumed work on January 31, and remained constantly at work until February 26, when she was returned to Cape Fear River.

The total expenditures for the year were \$28,506.70, from which we deduct \$4,948.73 liabilities outstanding on June 30, 1906 (there being no liabilities outstanding June 30, 1907), leaving the actual cost of the year's work \$23,557.97. This sum includes rental at the rate of \$28.50 per working day paid to the appropriation to which the dredge belongs, but does not include the bulk of the cost of the repairs made at Norfolk, Va., which was paid by the appropriation for Cape Fear River at and below Wilmington, N. C. It does include the cost of minor repairs incidental to the work, however, and also includes the necessary surveys and superintendence. This sum effected the removal of 221,852 cubic yards of material, the average cost of which was 10.62 cents per cubic yard.

There is no reliable survey of a recent date, but from an examination made during the latter part of May, 1907, the minimum depth was found to be 20 feet and the minimum width approximately 200 feet. A careful survey of the channel and vicinity will be made at the first opportunity.

*Money statement.*

July 1, 1906, balance unexpended.....	\$29,022. 46
Amount appropriated by river and harbor act approved March 2, 1907.....	5,000. 00
	<hr/> 34,022. 46
June 30, 1907, amount expended during fiscal year, for works of improvement .....	28,506. 70
July 1, 1907, balance unexpended.....	<hr/> 5,515. 76
<hr/>	
{ Amount that can be profitably expended in fiscal year ending June 30, 1909, for maintenance of improvement, in addition to the balance unexpended July 1, 1907.....	5,000. 00
{ Submitted in compliance with requirements of sundry civil act of June 4, 1897, and of section 7 of the river and harbor act of 1899.	

APPROPRIATIONS.

Date.	Amount.	Aggregate.
March 3, 1906.....	\$45,000	\$45,000
March 2, 1907.....	5,000	50,000

COMMERCIAL STATISTICS FOR THE YEAR ENDING DECEMBER 31, 1906.

Class of goods.	Tons.	Unit price.	Value.
Fish .....	4,465	60	\$267,900
Lumber .....	5,000	10	50,000
General merchandise .....	1,000	140	140,000
Total .....	10,465	.....	457,900

Loss in volume since last year 5,189 tons.

Transportation lines established during the year, none.

*Statement of vessels navigating Beaufort Inlet, North Carolina, during the calendar year ending December 31, 1906.*

Class of vessel.	Number.	Aggregate net tonnage.	Draft.
Steamers .....	71	2,640	<i>Fed.</i> 8 to 12
Schooners, sloops, etc .....	75	1,400	2 to 12
Launches and yachts .....	170	1,100	2 to 10

M 10.

NEW RIVER, INCLUDING INLAND WATERWAYS BETWEEN BEAUFORT HARBOR AND NEW RIVER AND BETWEEN NEW RIVER AND SWANSBORO, NORTH CAROLINA.

(A) NEW RIVER.

*Reference.*—See page 276, current summary.

There was no work carried on during the year except a survey of the locality around Cedar Bush Marsh to ascertain the benefits derived from the rebuilding of the dike and collecting commercial statistics.

The survey shows a 4-foot mean low-water channel around Cedar Bush Marsh, but it is less than 100 feet wide at three points for short distances.

The liabilities incurred during the year were for maintenance, and amounted to \$137.84, of which \$2.85 was outstanding on June 30, 1907.

An additional appropriation of \$2,000 for maintenance is recommended.

*Money statement.*

July 1, 1906, balance unexpended.....	\$133.04
Amount allotted from river and harbor act approved March 2, 1907.....	2,000.00
	2,133.04
June 30, 1907, amount expended during fiscal year, for maintenance of improvement.....	134.99
July 1, 1907, balance unexpended.....	1,998.05
July 1, 1907, outstanding liabilities.....	2.85
July 1, 1907, balance available.....	1,995.20
Amount that can be profitably expended in fiscal year ending June 30, 1909, for maintenance of improvement, in addition to the balance unexpended July 1, 1907.....	
Submitted in compliance with requirements of sundry civil act of June 4, 1897, and of section 7 of the river and harbor act of 1899.	
	2,000.00

APPROPRIATIONS.

Date.	Amount.	Aggregate.
July 4, 1886, to July 7, 1888.....		\$50,000.00
August 2, 1882.....	\$5,000.00	5,000.00
July 4, 1884.....	5,000.00	10,000.00
August 5, 1886.....	10,000.00	20,000.00
August 11, 1888.....	3,000.00	23,000.00
September 19, 1890.....	5,000.00	28,000.00
July 13, 1892.....	5,000.00	33,000.00
March 2, 1907.....	* 2,000.00	35,000.00
Sales.....	.10	35,000.10

\* Allotted from combined appropriation.

COMMERCIAL STATISTICS FOR THE YEAR ENDING DECEMBER 31, 1906.

Class of goods.	Tons.	Price.	Value.
Cotton.....	101	\$210	\$21,210
Cotton seed.....	900	20	18,000
Cotton-seed meal.....	400	25	10,000
Grains.....	60	35	2,100
Hay.....	105	20	2,100
Potatoes.....	200	20	4,000
Vegetables.....	50	20	1,000
Cattle.....	2	60	120
Horses.....	1	100	100
Hogs.....	2	100	200
Fish.....	400	60	24,000
Oysters.....	250	35	8,750
Clams.....	425	50	21,250
Rosin.....	200	25	5,000
Turpentine, crude.....	13	28	364
Timber.....	7,850	7	51,450
Fertiliser.....	800	22	17,600
General merchandise.....	2,025	140	283,500
Peanuts.....	18	60	960
Rafting gear.....	860	80	28,800
Total.....	13,660		500,504

# 1238 REPORT OF THE CHIEF OF ENGINEERS, U. S. ARMY.

*Statement of vessels navigating New River, North Carolina, during the calendar year ending December 31, 1906.*

Class of vessel.	Number.	Aggregate net tonnage.	Draft.
Schooners.....	1	20	Feet. 4
Launches.....	21	90	2 to 3½
Sharpies.....	19	70	1 to 3
Scow.....	1	18	4

## (B) INLAND WATERWAY BETWEEN NEW RIVER AND SWANSBORO.

*Reference.*—See page 277 of current summary.

Dredging operations were in progress at the beginning of the fiscal year, and were suspended on November 7, 1906, for want of funds.

Work was done by Government plant and hired labor, at an actual cost of \$2,565.32.

There were removed from Stand Back shoal 2,052 cubic yards of material, completing a cut through this shoal 25 feet wide and 3 feet deep at low water; and from Sand shoal, 17,795 cubic yards of material, from a cut 5,738 feet long, 25 feet wide, and 3 feet deep at low water, making a total of 19,849 cubic yards of material, which cost 12.9+ cents per cubic yard.

An additional appropriation of \$16,000 is recommended, of which it is proposed to apply about \$15,000 to improvement by dredging, and about \$1,000 to maintenance. It is proposed to apply the available funds to improvement by dredging, as soon as plant can be spared for that purpose.

### *Money statement.*

July 1, 1906, balance unexpended.....	\$3, 224. 40
Amount allotted from river and harbor act approved March 2, 1907.....	12, 000. 00
	15, 224. 40
June 30, 1907, amount expended during fiscal year, for works of improvement.....	3, 224. 40
July 1, 1907, balance unexpended.....	12, 000. 00
Amount (estimated) required for completion of existing project.....	26, 000. 00
{ Amount that can be profitably expended in fiscal year ending June 30, 1909, in addition to the balance unexpended July 1, 1907:	
For works of improvement.....	\$15, 000. 00
For maintenance of improvement.....	1, 000. 00
	16, 000. 00
{ Submitted in compliance with requirements of sundry civil act of June 4, 1897, and of section 7 of the river and harbor act of 1899.	

### APPROPRIATIONS.

Date.	Amount.	Aggregate.
September 19, 1890.....	\$5, 000	\$5, 000
March 2, 1907.....	a 12, 000	17, 000

\* Allotted from combined appropriation.



## COMMERCIAL STATISTICS FOR THE YEAR ENDING DECEMBER 31, 1906.

Class of goods.	Tons.	Unit price.	Value.
Cotton.....	37	\$210	\$7,770
Cotton seed.....	200	20	4,000
Fish.....	250	60	15,000
Oysters.....	1,000	35	35,000
Clams.....	500	50	25,000
Rosin.....	714	20	14,280
Turpentine, spirits.....	285	140	39,900
Timber.....	2,500	6	15,000
Fertilizers.....	400	22	88,000
General merchandise.....	800	140	112,000
Total.....	6,686	.....	355,950

Gain over last year, 5,303 tons.

Transportation lines established during the year, none.

*Statement of vessels navigating the waterway between New River and Swansboro, N. C., during the calendar year ending December 31, 1906.*

Class of vessel.	Number.	Aggregate net tonnage.	Draft.
Steamers.....	1	52	4
Sharpies.....	50	600	2 to 4
Launches.....	25	250	2 to 4

(C) WATERWAY BETWEEN BEAUFORT HARBOR AND NEW RIVER (I. E., PORTION BETWEEN BEAUFORT AND SWANSBORO).

*Reference.*—See page 279, current summary.

There was no actual work done during the fiscal year 1907. The expenses incurred amounted to \$293.02 and were for repairing plant and collecting commercial statistics.

It is proposed to use the balance on hand, together with the additional appropriation recommended, in maintenance and in increasing the width of the dredged cuts to the project width of 100 feet.

*Money statement.*

July 1, 1906, balance unexpended.....	\$2,310.66
Amount allotted from river and harbor act approved March 2, 1907.....	3,000.00
	5,310.66
June 30, 1907, amount expended during fiscal year, for maintenance of improvement.....	293.02
July 1, 1907, balance unexpended.....	5,017.64
Amount (estimated) required for completion of existing project.....	16,040.00
Amount that can be profitably expended in fiscal year ending June 30, 1909, in addition to the balance unexpended July 1, 1907:	
For works of improvement.....	\$12,000.00
For maintenance of improvement.....	1,000.00
	13,000.00
Submitted in compliance with requirements of sundry civil act of June 4, 1897, and of section 7 of the river and harbor act of 1899.	

## APPROPRIATIONS.

Date.	Amount.	Aggregate.	Date.	Amount.	Aggregate.
August 5, 1886 .....	\$10,000	\$10,000	August 18, 1894 .....	\$2,500	\$42,500
August 11, 1888 .....	5,000	15,000	June 3, 1896 .....	1,000	43,500
September 19, 1890 .....	15,000	30,000	June 13, 1902 .....	9,500	53,000
July 18, 1892 .....	10,000	40,000	March 2, 1907 .....	2,000	55,000

\*Allotted from combined appropriation.

## COMMERCIAL STATISTICS FOR THE YEAR ENDING DECEMBER 31, 1906.

Class of goods.	Tons.	Unit price.	Value.
Cotton .....	225	\$210	\$47,250
Cotton seed .....	891	20	7,820
Cotton-seed meal .....	300	25	7,500
Grains .....	250	35	8,750
Hay .....	143	20	2,860
Potatoes .....	50	20	1,000
Vegetables .....	125	20	2,500
Poultry .....	1	200	200
Eggs .....	1	300	300
Fish .....	2,288	60	137,280
Oysters .....	6,000	35	210,000
Clams .....	2,120	50	106,000
Rosin .....	625	25	15,625
Turpentine, spirits .....	250	145	36,250
Wood .....	1,600	4	6,400
Lumber .....	7,500	10	75,000
Shingles .....	50	8	400
Fertilizers .....	300	22	6,600
Machinery .....	100	25	2,500
General merchandise .....	6,752	140	945,280
Soft crabs .....	79	120	9,480
Peanuts .....	32	60	1,920
Fish oil .....	10	75	750
Cross-ties .....	405	7	2,835
Total .....	29,602	.....	1,634,600

*Statement of vessels navigating waterway between Beaufort Harbor and New River, North Carolina, during the calendar year ending December 31, 1906.*

Class of vessels.	Number.	Aggregate net tonnage.	Draft.
Steamers .....	12	800	Feet. 2 to 4
Schooners, etc .....	125	1,250	2 to 4
Launches .....	60	650	2 to 4

## M II.

## IMPROVEMENT OF NORTHEAST (CAPE FEAR) AND BLACK RIVERS AND CAPE FEAR RIVER ABOVE WILMINGTON, NORTH CAROLINA.

## (A) NORTHEAST RIVER, N. C.

*Reference.*—See page 280, current summary.

The work of the year consisted of maintenance by snagging, repairing and caring for plant, and in collecting commercial statistics. The work was done by hired labor and Government plant.

Active operations were carried on during July, 1906. The worst obstructions were removed between the thirty-seventh and sixty-

eighth mile boards. No work was done above the sixty-eighth mile board, as the stage of water would not permit work to be done above that point when plant was available.

There were removed from the channel 33 large snags, 10 stumps, 51 logs, and 30 trees; 34 trees were cut from the banks and hauled back.

The actual field cost of this work was \$266.50, to which should be added \$75.40 for office expenses, making the total cost of the year's work, \$341.93.

A present draft of 6 feet can be carried 48 miles to Bannerman's bridge, and 3 feet to Croom's bridge, 8 miles above, at lowest stages; from Croom's bridge, 47 miles to Kornegay's bridge, the stream is navigable only for small boats and rafts for about eight months during the year.

The minimum low-water depth to Bannerman's bridge is 6 feet; to Croom's bridge, 3 feet; to Hallsville, 0.5 foot; to Kornegay's bridge (the head of navigation), 0.1 foot.

With the available balance it is proposed to maintain the natural channel to Hallsville.

An additional appropriation of \$3,000 is recommended for maintenance.

#### *Money statement.*

July 1, 1908, balance unexpended.....	\$1, 365. 55
Amount appropriated by river and harbor act approved March 2, 1907.....	2, 000. 00
	<hr/>
	3, 365. 55
June 30, 1907, amount expended during fiscal year, for maintenance of improvement.....	341. 93
	<hr/>
July 1, 1907, balance unexpended.....	3, 023. 62
July 1, 1907, outstanding liabilities.....	1. 75
	<hr/>
July 1, 1907, balance available.....	3, 021. 87
	<hr/>
{ Amount that can be profitably expended in fiscal year ending June 30, 1909, for maintenance of improvement, in addition to the balance unexpended July 1, 1907.....	3, 000. 00
{ Submitted in compliance with requirements of sundry civil act of June 4, 1897, and of section 7 of the river and harbor act of 1899.	

#### APPROPRIATIONS.

September 19, 1890, for Northeast (Cape Fear) River, North Carolina.....	\$5, 000. 00
July 13, 1892, for Northeast (Cape Fear) River, North Carolina.....	5, 000. 00
August 18, 1894, for Northeast (Cape Fear) River, North Carolina.....	5, 000. 00
March 3, 1899, for Northeast River, North Carolina.....	2, 000. 00
June 13, 1902, for Northeast River, North Carolina.....	* 2, 000. 00
Other receipts, March 4, 1897, sales to Cape Fear River.....	243. 33
Allotted from emergency appropriation June 13, 1902.....	500. 00
March 3, 1905.....	* 2, 000. 00
March 2, 1907.....	* 2, 000. 00
	<hr/>
Total.....	23, 743. 33

\* Allotted from joint appropriation for Northeast and Black rivers, North Carolina, and Cape Fear River, North Carolina, above Wilmington.

## COMMERCIAL STATISTICS FOR THE YEAR ENDING DECEMBER 31, 1906.

Class of goods.	Tons.	Unit price.	Value.
Cotton.....	406	\$210	\$85,260
Cotton seed.....	250	20	5,000
Cotton-seed meal.....	90	25	2,250
Rice, rough.....	8	50	400
Grains.....	178	35	6,230
Hay.....	20	20	400
Potatoes.....	30	20	600
Vegetables.....	5	20	100
Cattle.....	25	60	1,500
Hogs.....	11	100	1,100
Poultry.....	10	200	2,000
Eggs.....	8	300	2,400
Rosin.....	1,079	25	26,975
Turpentine:			
Crude.....	875	28	10,500
Spirits.....	208	145	29,435
Wood.....	5,000	4	20,000
Timber.....	70,702	7	494,914
Lumber.....	2,810	10	23,100
Shingles.....	878	8	2,884
Fertilizers.....	12,091	22	266,002
Brick.....	6,813	8	18,989
General merchandise.....	2,000	140	280,000
Tar.....	406	12	4,872
Peanuts.....	24	60	1,440
Cross-ties.....	3,750	7	26,250
Poles and pile.....	479	5	2,395
Total.....	106,151	.....	1,314,946

Loss in volume since last year, 5,828 tons.

No transportation lines established during the year.

Number of passengers (estimated), 500.

## (B) IMPROVING BLACK RIVER, NORTH CAROLINA.

*Reference.*—See page 281 of current summary.

The work during the fiscal year consisted of maintenance by snagging, caring for plant, and collecting commercial statistics. Snagging was done by hired labor and government plant.

Active operations were carried on during August, 1906. The worst obstructions were removed from both channel and banks, between the forty-third and seventy-fifth mile boards.

The total expenditures during the fiscal year were \$721.39, from which the outstanding liabilities of the previous year should be deducted, leaving \$544.32 as the actual cost of operations, which resulted in the removal from the channel of 15 large snags, 3 stumps, 5 logs, and 33 trees. Nineteen trees were cut and hauled back from the banks.

With the available balance it is proposed to maintain the natural channel up as far as Clear Run. An additional appropriation of \$3,000 is recommended for maintenance.

The small appropriations for the past five or six years have not been sufficient to properly maintain the channel.

*Money statement.*

July 1, 1906, balance unexpended.....	\$1,900. 16
Amount appropriated by river and harbor act approved March 2, 1907.....	2,000. 00
	3,900. 16
June 30, 1907, amount expended during fiscal year, for maintenance of improvement.....	721. 39
July 1, 1907, balance unexpended.....	3,178. 77
Amount that can be profitably expended in fiscal year ending June 30, 1909, for maintenance of improvement, in addition to the balance unexpended July 1, 1907.....	
Submitted in compliance with requirements of sundry civil act of June 4, 1897, and of section 7 of the river and harbor act of 1899.	
	3,000. 00

## APPROPRIATIONS.

Date.	Amount.	Aggregate.	Date.	Amount.	Aggregate.
August 5, 1896.....	\$3,000	\$3,000	Allotted from emergency appropriation, June 13, 1902.....	\$500.00	\$20,500.00
July 13, 1892.....	10,000	13,000	March 8, 1906.....	a 2,000.00	22,500.00
August 17, 1894.....	2,000	15,000	March 2, 1907.....	a 2,000.00	24,500.00
June 3, 1896.....	1,000	16,000	Sales, etc.....	243.84	24,743.84
March 3, 1899.....	2,000	18,000			
June 13, 1902.....	a 2,000	20,000			

\*Allotted from joint appropriation for Northeast and Black rivers, North Carolina, and Cape Fear River, North Carolina, above Wilmington.

## COMMERCIAL STATISTICS FOR THE YEAR ENDING DECEMBER 31, 1906.

Class of goods.	Tons.	Unit price.	Value.
Cotton.....	250	\$210	\$52,500
Cotton seed.....	125	20	2,500
Cotton-seed meal.....	300	25	7,500
Grains.....	183	35	6,475
Hay.....	75	20	1,500
Potatoes.....	44	20	880
Vegetables.....	30	20	600
Cattle.....	44	60	2,640
Horses.....	4	100	400
Hogs.....	38	100	3,800
Poultry.....	21	200	4,200
Eggs.....	14	300	4,200
Fish.....	3	60	180
Rosin.....	8,267	25	81,665
Turpentine:			
Crude.....	341	28	9,548
Spirits.....	529	145	76,705
Wood.....	6,500	4	26,000
Timber.....	26,900	7	188,300
Lumber.....	896	10	8,960
Shingles.....	2,500	8	20,000
Fertilizers.....	740	22	16,280
Machinery.....	25	100	2,500
General merchandise.....	4,227	140	591,780
Tar.....	971	15	14,565
Peanuts.....	26	60	1,560
Brick.....	15	8	45
Cross-ties.....	8,063	7	56,441
Poles and piles.....	920	5	4,600
Total.....	57,058	.....	1,186,824

Loss in volume since last year, 11,582 tons.

Transportation lines established during the year, none.

Number of passengers (estimated), 500.

*Freight transported.*

Calendar year ending December 31—	Tons.	Calendar year ending December 31—Continued—	Tons.
1885.....	48, 650	1898.....	38, 139
1890.....	61, 311	1899.....	48, 533
1891.....	79, 429	1900.....	58, 087
1892.....	56, 051	1901.....	61, 069
1893.....	45, 003	1902.....	72, 224
1894.....	41, 130	1903.....	74, 123
1895.....	63, 262	1904.....	72, 677
1896.....	69, 033	1905.....	68, 635
1897.....	31, 144	1906.....	57, 053

*Statement of vessels navigating Black River, North Carolina, during the calendar year ending December 31, 1906.*

Class of vessels.	Number.	Aggregate net tonnage.	Draft.
Steamers.....	4	126	<i>Fect.</i> 2.5-3.5
Steam tugs.....	6	94	3.5-4.5
Plats (about).....	40	3, 000	1.6-4.5

## (C) CAPE FEAR RIVER ABOVE WILMINGTON, N. C.

*References.*—See page 282 of current summary.

The project of 1881 has been about 30 per cent completed, and no work under it, except for maintenance, has been done for several years. It has been superseded by the canalization project of 1902, but, pending the completion of the latter, maintenance work on the former project is being kept up.

The work of maintenance during the year has been the removal of the worst obstructions between the mouth of Black River and Fayetteville. Work was done by hired labor and Government plant. The cost of the work during the year for maintenance amounted to \$1,702.35, after deducting the outstanding liabilities at the beginning of the year, and resulted in the removal of 336 large snags, 10 stumps, and 144 trees from the channel; 746 trees were cut and hauled back from the banks.

*Canalization.*—The expenses of the year on the canalization project amounted to \$1,589.71. The work accomplished by this expenditure consisted in the purchase of site for lower dam, examination of titles to other tracts of land required, inspecting the river, in the purchase of stone markers for land, and in keeping gauge records.

The locations of the sites selected are Site No. 1, at Kings Bluff, 40 miles above Wilmington; Site No. 2, at Browns Landing, 72 miles above Wilmington, and Site No. 3, at Tolers Landing, 95 miles above Wilmington. The last two locations are subject, however, to obtaining satisfactory title, either by purchase or condemnation proceedings.

*Money statements.*

## GENERAL IMPROVEMENT.

July 1, 1906, balance unexpended.....	\$4,437.25
Amount appropriated by river and harbor act approved March 2, 1907.....	5,000.00
	9,437.25
June 30, 1907, amount expended during fiscal year, for maintenance of improvement.....	1,916.36
July 1, 1907, balance unexpended.....	7,520.89
Amount that can be profitably expended in fiscal year ending June 30, 1909, for maintenance of improvement, in addition to the balance unexpended July 1, 1907.....	
Submitted in compliance with requirements of sundry civil act of June 4, 1897, and of section 7 of the river and harbor act of 1899.	
	5,000.00

## LOCKS AND DAMS.

July 1, 1906, balance unexpended.....	\$37,569.99
June 30, 1907, amount expended during fiscal year, for works of improvement.....	1,670.82
July 1, 1907, balance unexpended.....	35,899.17
July 1, 1907, outstanding liabilities.....	132.98
July 1, 1907, balance available.....	35,766.19
Amount (estimated) required for completion of existing project.....	1,300,000
Amount that can be profitably expended in fiscal year ending June 30, 1909, for works of improvement, in addition to the balance unexpended July 1, 1907.....	
Submitted in compliance with requirements of sundry civil act of June 4, 1897.	
	450,000.00

## APPROPRIATIONS.

Date.	Amount.	Aggregate.	Date.	Amount.	Aggregate.
March 3, 1881.....	\$30,000.00	\$30,000.00	June 3, 1896.....	\$5,000.00	\$137,250.00
August 2, 1882.....	30,000.00	60,000.00	March 3, 1899.....	5,000.00	142,250.00
July 5, 1884.....	5,000.00	65,000.00	June 18, 1902.....	50,000.00	192,250.00
August 5, 1886.....	11,250.00	76,250.00	Do.....	25,000.00	198,250.00
August 11, 1888.....	12,000.00	88,250.00	March 3, 1905.....	25,000.00	208,250.00
September 19, 1890.....	15,000.00	103,250.00	March 2, 1907.....	25,000.00	208,250.00
July 18, 1892.....	15,000.00	118,250.00	Sales, etc.....	414.88	208,664.88
August 18, 1894.....	14,000.00	132,250.00			

\* Allotted from joint appropriations for Northeast and Black rivers, North Carolina, and Cape Fear River, North Carolina, above Wilmington.

## COMMERCIAL STATISTICS FOR THE YEAR ENDING DECEMBER 31, 1906.

Class of goods.	Tons.	Unit price.	Value.
Cotton.....	2,250	\$210	\$472,500
Cotton seed.....	600	20	12,000
Cotton-seed meal.....	225	25	5,625
Tobacco, leaf.....	15	200	3,000
Rice, rough.....	10	50	500
Grains.....	150	35	5,250
Hay.....	95	20	1,900
Potatoes.....	80	20	1,600
Vegetables.....	55	20	1,100
Cattle.....	99	60	5,940
Horses.....	25	100	2,500
Hogs.....	55	100	5,500
Poultry.....	80	200	16,000

COMMERCIAL STATISTICS FOR THE YEAR ENDING DECEMBER 31, 1906—Cont'd.

Class of goods.	Tons.	Unit price.	Value.
Eggs.....	42	\$300	\$12,600
Fish.....	10	60	600
Rosin.....	2,091	25	52,275
Turpentine:			
Crude.....	844	28	28,682
Spirits.....	562	145	81,490
Wood.....	9,000	4	36,000
Timber.....	41,294	7	289,068
Lumber.....	5,400	10	54,000
Shingles.....	1,875	8	15,000
Fertilizers.....	28,340	22	623,480
Machinery.....	100	100	10,000
General merchandise.....	12,200	140	1,708,000
Poles and piles.....	3,918	5	19,590
Tar.....	1,863	15	27,945
Peanuts.....	12	60	720
Brick.....	5,250	3	15,750
Cross-ties.....	19,500	7	136,500
Total.....	135,991	.....	3,680,078

## M 12.

## IMPROVEMENT OF CAPE FEAR RIVER, NORTH CAROLINA, AT AND BELOW WILMINGTON.

*Reference.*—See page 284, current summary.

The operations of the year have been the work of the suction dredge *Cape Fear* on the ocean bar and Snows Marsh channels, during part of the year, and of the clam-shell dredge *Ajax* on the river channels; also repairing of New Inlet and Swash Defense dams; making minor surveys and caring for plant. All work was done by hired labor and government plant.

Expenditures of the year were \$136,284.43, of which there was outstanding at the beginning of the fiscal year the sum of \$11,875.33, leaving \$124,409.10, pertaining to the fiscal year 1907. To this there should be added \$29,115.38, outstanding at the close of the fiscal year, and we obtain the sum of \$153,524.48 as the actual expenses incurred during the year.

The sum of \$6,401.25 was received for rent of dredge (to the Beaufort Inlet improvement) and as proceeds of the sale of condemned property. This deducted from the above sum leaves the appropriation reduced by \$147,125.25, for which the following work was accomplished:

172,638 cubic yards of sand and mud removed by dredge <i>Cape Fear</i> , at 8+ cents per cubic yard.....	\$13,911.58
(Included in the cost of dredging by <i>Cape Fear</i> is the cost of special repairs to the <i>Cape Fear</i> , \$2,424.09.)	
428,740 cubic yards of sand and mud removed by the <i>Ajax</i> , at 10.3—cents per cubic yard.....	44,768.49
(Included in the cost of the dredging by <i>Ajax</i> is the cost of a new boiler and extraordinary repairs to <i>Ajax</i> and tug <i>Cynthia</i> .)	
800 linear feet of New Inlet and 3,351 linear feet of Swash Defense dams were repaired and capped with concrete above about half tide, prior to the storm of September 17, 1906; 8,600 linear feet of fill along the toe of Swash Defense dam washed out by weir action during the storm, were replaced by the <i>Ajax</i> ; the stone dislodged by storm was replaced, all at a cost of.....	23,884.74
Paid on purchase of new dredge.....	53,663.30
Paid on purchase of two scows.....	17,296.87
Total.....	153,524.48



As a result of the year's work, the bar channel has been maintained and the river channels maintained and widened as follows:

Number of linear feet.	Original width.	Present width.
	<i>Feet.</i>	<i>Feet.</i>
5,700	259	270
7,000	148	270
1,500	148	240
4,000	186	270

With the available balance, it is proposed to complete repairs to the dams, maintain the present dredged channels, and continue the project in accordance with House Document 545, Fifty-ninth Congress, first session.

Additional appropriations of \$250,000 for continuing improvement and for maintenance, exclusive of the appropriation of \$250,000 for continuing improvement provided for in the river and harbor act of March 2, 1907, are asked for.

*Money statement.*

July 1, 1906, balance unexpended.....	\$239, 779. 39
Amount appropriated by river and harbor act approved March 2, 1907 .....	\$165, 000. 00
Amount appropriated by sundry civil act approved March 4, 1907 .....	100, 000. 00
Amount received from sales, rents, and refundments.....	6, 401. 76
	<u>271, 401. 76</u>
	511, 181. 15
June 30, 1907, amount expended during fiscal year:	
For works of improvement .....	\$94, 633. 43
For maintenance of improvement.....	41, 651. 00
	<u>136, 284. 43</u>
July 1, 1907, balance unexpended.....	374, 896. 72
July 1, 1907, outstanding liabilities.....	29, 115. 38
	<u>345, 781. 34</u>
July 1, 1907, balance available.....	
July 1, 1907, amount covered by uncompleted contracts.....	53, 137. 50
Amount (estimated) required for completion of existing project.....	1, 150, 000. 00
	<u><u>\$500, 000. 00</u></u>
Amount that can be profitably expended in fiscal year ending June 30, 1909, in addition to the balance unexpended July 1, 1907:	
For works of improvement.....	\$435, 000. 00
For maintenance of improvement.....	65, 000. 00
	<u>\$500, 000. 00</u>
Submitted in compliance with requirements of sundry civil act of June 4, 1897, and of section 7 of the river and harbor act of 1890.	

\*\$250,000.00 provided for in sundry civil bill.

# 1248 REPORT OF THE CHIEF OF ENGINEERS, U. S. ARMY.

## APPROPRIATIONS.

Date.	Amount.	Aggregate.	Date.	Amount.	Aggregate.
March 2, 1829, to July 22, 1854.....		\$368,228.92	August 11, 1888.....	\$245,000.00	\$2,105,000.00
July 11, 1870.....	\$100,000.00	100,000.00	September 19, 1890.....	170,000.00	2,275,000.00
March 8, 1871.....	75,000.00	175,000.00	July 13, 1892.....	200,000.00	2,475,000.00
June 10, 1872.....	100,000.00	275,000.00	August 18, 1894.....	200,000.00	2,675,000.00
March 8, 1873.....	100,000.00	375,000.00	June 3, 1896.....	195,000.00	2,870,000.00
June 23, 1874.....	150,000.00	525,000.00	March 3, 1899.....	150,000.00	3,020,000.00
March 8, 1875.....	150,000.00	675,000.00	June 13, 1902.....	150,000.00	3,170,000.00
August 14, 1876.....	132,500.00	807,500.00	Allotted from maintenance appropriation act April 28, 1904.....	30,000.00	3,200,000.00
June 18, 1878.....	160,000.00	967,500.00	March 3, 1905.....	150,000.00	3,350,000.00
March 8, 1879.....	100,000.00	1,067,500.00	June 30, 1906 (sundry civil act).....	200,000.00	3,550,000.00
June 14, 1880.....	70,000.00	1,137,500.00	March 2, 1907.....	165,000.00	3,715,000.00
March 8, 1881.....	140,000.00	1,277,500.00	March 4, 1907 (sundry civil act).....	100,000.00	3,815,000.00
August 2, 1882.....	225,000.00	1,502,500.00	Sales and rents.....	32,323.07	3,847,323.07
July 5, 1884.....	200,000.00	1,702,500.00			
August 5, 1886.....	157,500.00	1,860,000.00			

\* Balance of \$3,728.07 turned over to surplus fund.

## CONTRACTS IN FORCE.

### CLAM-SHELL DREDGE.

Contractor: Theo. Smith & Sons Company, Jersey City, N. J.

Date of contract: February 26, 1907.

Date of approval: March 22, 1907.

Date of commencement: Unknown.

Date of completion: In force.

For clam-shell dredge at Wilmington, N. C., for \$61,350.

### STONE.

Contractor: Winnsboro Granite Corporation, Charleston, S. C.

Date of contract: June 1, 1907.

Date of approval: June 19, 1907.

Date of commencement: June 26, 1907.

Date of completion: In force.

For delivery of about 20,000 tons of stone at Wilmington, N. C., for use in repairs to dams at mouth of Cape Fear River.

## COMMERCIAL STATISTICS FOR YEAR ENDING DECEMBER 31, 1906.

### Exports.

	Quantity.	Unit price.	Value.
FOREIGN AND COASTWISE.			
	Tons.		
Cotton.....	77,850	\$210	\$16,348,500
Cotton-seed meal.....	640	25	16,000
Grain.....	780	85	27,300
Hay.....	325	20	6,520
Horses.....	20	100	2,000
Tar.....	4,729	15	70,935
Turpentine:			
Spirits.....	4,046	145	586,670
Crude.....	4,434	28	124,152
Rosin.....	10,435	25	260,875
Lumber.....	68,980	10	689,800
Gum logs.....	3,000	5	15,000
Poplar wood.....	775	5	3,875
Shingles.....	3,256	8	26,048
Peanuts.....	986	60	59,160
Fertilizer.....	1,952	22	42,944
Machinery.....	301	100	30,100
Coal.....	4,286	5	21,180
Cross-ties.....	18,300	7	128,100
Miscellaneous (dry goods, groceries, hardware, etc.).....	47,385	140	6,633,900
Fish oil.....	676	75	48,125
Fish scrap.....	560	22	12,100
Pitch.....	269	12	3,228
Total.....	258,775		25,161,012

## COMMERCIAL STATISTICS FOR YEAR ENDING DECEMBER 31, 1906—Continued.

*Exports—Continued.*

	Quantity.	Unit price.	Value.
<b>INTERNAL.</b>			
[Furnished by steamboat, flat, and raft men.]			
	<i>Tons.</i>		
Cotton-seed meal.....	640	\$25.00	\$16,000.00
Grain.....	743	35.00	26,005.00
Hay.....	835	20.00	6,700.20
Fertilizer.....	41,222	22.00	906,884.00
Machinery.....	277	100.00	27,700.00
Brick.....	25	3.00	75.00
General merchandise.....	26,057	140.00	3,647,980.00
Horses.....	29	100.00	2,900.00
Ice.....	100	10.00	1,000.00
Coal.....	50	5.00	250.00
Cement.....	572	10.00	5,720.00
Crushed stone.....	1,856	2.50	4,637.50
Riprap stone.....	2,155	1.75	3,771.25
Total.....	74,060		4,749,622.75

*Imports.*

	Quantity.	Unit price.	Value.
	<i>Tons.</i>		
Cotton.....	2,934	\$210	\$616,140
Cotton seed.....	975	20	19,500
Tobacco.....	15	200	3,000
Rough rice.....	266	50	13,300
Potatoes.....	308	20	6,160
Vegetables.....	111	20	2,220
Cattle.....	171	60	10,260
Hogs.....	112	100	11,200
Poultry.....	62	200	12,400
Eggs.....	67	300	20,100
Rosin.....	7,965	25	199,125
Turpentine:			
Spirits.....	1,566	145	227,070
Crude.....	1,721	30	51,630
Wood.....	20,870	4	83,480
Timber.....	139,021	7	973,147
Lumber.....	15,044	10	150,440
Shingles.....	4,762	8	38,096
Brick.....	11,678	3	34,784
Tar.....	3,275	15	49,125
Peanuts.....	92	60	5,520
Cross-ties.....	31,800	7	222,600
Poles and piles.....	6,081	5	30,155
Fish.....	16	20	320
Rice straw.....	80	20	1,600
Fish scrap.....	5,850	22	128,700
Fish oil.....	38	75	2,850
Clams.....	10	50	500
Fertilizer.....	1,125	22	24,750
Total.....	256,865		2,948,122
<b>FOREIGN AND COASTWISE.</b>			
[Furnished by importers and manufacturers.]			
Cotton.....	1,466	210	307,860
Cotton seed.....	174	20	3,480
Cotton-seed oil.....	15	140	2,100
Tobacco.....	500	200	100,000
Rice.....	6	50	300
Potatoes.....	815	20	16,300
Vegetables.....	75	20	1,500
Cattle.....	31	60	1,860
Hogs.....	41	100	4,100
Poultry.....	103	200	20,600
Eggs.....	95	300	28,500
Fish.....	312	60	18,720
Oysters.....	28	25	575
Clams.....	760	50	38,000

## 1250 REPORT OF THE CHIEF OF ENGINEERS, U. S. ARMY.

## COMMERCIAL STATISTICS FOR YEAR ENDING DECEMBER 31, 1906—Continued.

*Imports—Continued.*

	Quantity.	Unit Price.	Value.
FOREIGN AND COASTWISE—continued.			
[Furnished by importers and manufacturers]—Continued.			
Rosin .....	Tons. 4, 741	\$25	\$118, 525
Turpentine:			
Crude .....	140	28	3, 920
Spirits .....	562	145	81, 490
Wood .....	81	4	324
Timber .....	936	7	6, 562
Lumber .....	3, 008	10	30, 080
Shingles .....	21	8	168
Fertilizers .....	118, 519	22	2, 607, 418
Coal .....	10, 759	5	53, 795
Tar .....	542	15	8, 130
Peanuts .....	159	60	9, 540
General merchandise .....	87, 442	140	5, 241, 880
Salt .....	7, 258	10	72, 580
Cement .....	15, 183	10	151, 380
Kerosene oil .....	24, 986	35	872, 760
Molasses .....	402	50	20, 100
Crushed stone .....	1, 536	2	3, 072
Total .....	230, 591		9, 825, 559

*Foreign commerce for the calendar year 1906.*

[Furnished by the collector of customs of the port of Wilmington, N. C.]

Class of goods.	Quantity.	Value.	
		Exports.	Imports.
Cotton .....	bales 306, 685	\$17, 133, 045	.....
Rosin .....	barrels 88, 416	147, 854	.....
Tar .....	do 87	164	.....
Pitch .....	do 63	102	.....
Turpentine, spirits .....	gallons 23, 225	14, 156	.....
Lumber .....	M feet 4, 276	88, 362	.....
Shingles .....	do 813	5, 830	.....
Miscellaneous .....	tons 79, 809	.....	.....
Kainit .....	do 35, 451	.....	\$239, 868
Potash (muriate and sulphate of) .....	do 4, 594	.....	173, 436
Brimstone .....	do 11, 992	.....	36, 631
Molasses .....	gallons 55, 356	.....	5, 535
Miscellaneous .....	tons 3, 796	.....	213, 338
Total .....		17, 468, 822	668, 808

*Summary.*

	Tons.	Value.
EXPORTS.		
Foreign and coastwise .....	253, 775	\$25, 161, 012. 00
Internal .....	74, 060	4, 749, 622. 75
IMPORTS.		
Foreign and coastwise .....	230, 591	9, 825, 559. 00
Internal .....	255, 865	2, 948, 122. 00
Total commerce .....	814, 291	42, 684, 315. 75
Loss since last year .....	56, 815	6, 588, 991. 25

Transportation lines established during the year: None.

These commercial statistics do not include a large part of the business at Wilmington, which is done by the railroads.

*Statement of vessels navigating Cape Fear River, North Carolina, at and below  
Wilmington, during calendar year ending December 31, 1906.*

Class of vessel.	American.		Foreign.		Total.	
	Number.	Tonnage.	Number.	Tonnage.	Number.	Tonnage.
Steamships .....	134	200,319	50	93,841	184	294,160
Barks .....	3	1,461	5	3,073	8	4,534
Schooners .....	107	43,400	8	1,904	115	45,304
Brigs .....	3	1,089			3	1,089
Barges .....	11	17,410			11	17,410
Total .....	258	268,679	63	98,818	321	367,497

The above does not include vessels coming to Southport in distress for supplies or for a harbor, the total estimated tonnage of which is 20,000 tons.

Vessels owned by the United States Government are not included. No record is made of steamboats plying on the rivers above and below Wilmington or of steam tugs and small vessels of less than 100 net tons.

*Freight transported.*

Calendar year ending December 31—	Tons.	Calendar year ending December 31—	Tons.
1869 .....	220,000	1898 .....	627,890
1889 .....	325,512	1899 .....	621,852
1890 .....	346,557	1900 .....	609,356
1891 .....	344,443	1901 .....	727,359
1892 .....	341,468	1902 .....	841,631
1893 .....	392,965	1903 .....	843,337
1894 .....	437,623	1904 .....	856,011
1895 .....	618,054	1905 .....	871,106
1896 .....	673,208	1906 .....	814,291
1897 .....	595,426		

*Cotton steamers loaded at the port of Wilmington, N. C., during the calendar year ending December 31, 1906.*

[Furnished by Messrs. Alexander Sprunt & Son.]

Name of steamer.	Registered tonnage.	Draft loaded.	Number of bales.	Tons coal.
Brighton .....	2,274	20.4	11,456	43
Ribera .....	2,252	17.0	12,155	220
Sangstad .....	1,916	17.0	11,782	80
David Mainland .....	1,201	15.0	6,890	98
Manchester Merchant .....	2,707	19.6	13,847	
Putney Bridge .....	2,147	18.6	11,600	408
Petunia .....	1,093	16.6	5,460	196
Greatham .....	1,531	18.7	7,320	
Anglo Saxon .....	3,180	21.3	16,580	
Naparima .....	1,043	16.5	4,884	
Ribston .....	1,962	17.3	11,027	396
Nollisement .....	2,491	18.6	14,208	396
Marthara .....	2,518	18.3	13,100	
Beatrice .....	2,139	18.0	11,522	
Lord Curzon .....	2,338	19.6	14,383	556
Huron .....	1,990	18.3	10,000	
Osceola .....	2,318	19.5	13,808	
Rubens .....	2,321	18.8	12,158	
Valetta .....	1,937	19.0	10,077	58
Glenwood .....	1,253	16.5	6,000	254
Putney Bridge .....	2,147	19.4	12,400	358
Hampton .....	2,780	20.1	14,158	
Zamora .....	2,042	20.3	9,549	467
Sahara .....	2,665	19.5	13,781	
Winkfield .....	3,065	22.6	16,448	613
Gorsemore .....	1,979	18.0	10,887	
Labuan .....	2,294	18.3	12,183	
Total .....	57,568		306,658	4,131

## M 13.

## IMPROVEMENT OF SHALLOTTE RIVER, NORTH CAROLINA.

*References.*—See page 287, current summary.

Active work of improvement has not yet begun.

The work of the fiscal year consisted of making an examination for the purpose of obtaining information upon which to base a project for the expenditure of the appropriation of \$3,000. The total expenditures amounted to \$49.20. There were no outstanding liabilities at the close of the fiscal year.

*Money statement.*

Amount appropriated by river and harbor act approved March 2, 1907.	\$3,000.00
June 30, 1907, amount expended during fiscal year, for works of improvement.....	49.20
July 1, 1907, balance unexpended.....	2,950.80

## APPROPRIATION.

Date.	Amount.	Aggregate.
March 2, 1907.....	\$3,000	\$3,000

No authentic commercial statistics were obtained.

No list of vessels navigating Shallotte River has been obtained.

## APPENDIX N.

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### IMPROVEMENT OF WACCAMAW RIVER, NORTH CAROLINA AND SOUTH CAROLINA, AND OF CERTAIN RIVERS AND HARBORS IN SOUTH CAROLINA.

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REPORT OF CAPT. G. P. HOWELL, CORPS OF ENGINEERS, OFFICER IN CHARGE, FOR THE FISCAL YEAR ENDING JUNE 30, 1907.

#### IMPROVEMENTS.

- |   |   |
|---|---|
| 1. Waccamaw River, North Carolina and South Carolina, and Little Pedee River, South Carolina. | 7. Congaree River, South Carolina, from Gervais Street Bridge, Columbia, to Granby.         |
| 2. Lynchs River and Clarkes Creek, South Carolina.  | 8. Operating and care of lock and dam on Congaree River, South Carolina.                    |
| 3. Great Pedee River, South Carolina.   | 9. Inland waterways between Charleston Harbor, South Carolina, and opposite McClellanville. |
| 4. Winyah Bay, South Carolina.  | 10. Harbor at Charleston, South Carolina.   |
| 5. Mingo Creek, South Carolina.   |   |
| 6. Santee, Wateree, and Congaree rivers and Estherville-Minim Creek Canal, South Carolina.    |   |
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UNITED STATES ENGINEER OFFICE,  
*Charleston, S. C., July 9, 1907.*

GENERAL: I have the honor to transmit herewith my annual reports for the fiscal year ending June 30, 1907, for the works of improvement of rivers and harbors in this district.

Very respectfully,

G. P. HOWELL,  
*Captain, Corps of Engineers.*

Brig. Gen. A. MACKENZIE,  
*Chief of Engineers, U. S. A.*

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#### N 1.

### IMPROVEMENT OF WACCAMAW RIVER, NORTH CAROLINA AND SOUTH CAROLINA, AND LITTLE PEDEE RIVER, SOUTH CAROLINA.

#### (A) WACCAMAW RIVER.

Dredging was resumed by U. S. dredge *No. 3* in January, 1907, and was continued till June 22, 1907, when the dredge was withdrawn

for repairs. The material removed was 41,306 cubic yards of sand, 25 logs, and 140 stumps, divided as follows: 871 cubic yards at Conway along the wharf fronts; 3,525 cubic yards, 11 logs, and 9 stumps at Burroughs Cut, widening this cut to 100 feet; Daggetts Cut, 505 cubic yards and 1 stump, widening this cut to 100 feet; Loggy Creek Cut, 20,764 cubic yards, 129 stumps, and 12 logs, forming a cut 50 feet wide, which will later be widened to 100 feet, and Todds shoal, 15,641 cubic yards, 2 logs, and 1 stump, forming a channel through this shoal 50 feet wide. All these channels are 6 feet deep at low water. In connection with this dredging the snag boat *Little Pedee* removed from Burroughs Cut 21 logs, 2 stumps, and 13 large snags, and the snag boat *Wateree* removed at Loggy Creek Cut-off 133 trees, 12 logs, 8 stumps, and 12 large snags. A hand force removed from the proposed dredging lines in advance of the dredge the following: At Burroughs Cut 164 trees and 51 cords brush, and at Thorougfare Cut-off, where the dredge will next work, 937 trees, 270 cords brush, 813 logs, and 480 large snags. There was also an expenditure of \$915.30 for repairs to dredge *No. 1*, which had worked on this stream during the previous fiscal year.

The expenditures for the year were \$7,206.17, divided as follows:

Dredge <i>No. 3</i> , 41,306 cubic yards, at 12 cents per cubic yard	\$5, 237. 65
<i>Little Pedee</i> , 36 obstructions, at \$1.28 each	46. 11
<i>Wateree</i> , 201 obstructions, at \$1.38 each	278. 09
Hand force, 2,747 obstructions, at 26 cents each	729. 02
Dredge <i>No. 1</i> , repairs	915. 30
<b>Total</b>	<b>7, 206. 17</b>

A hand force worked above Conway, between 74 and 149 miles above mouth of the river, from November, 1906, through February, 1907, to remove obstructions interfering with navigation. There were removed from the banks 892 trees and 102 cords of brush, and from the channel 374 logs, 34 stumps, 660 large snags, at a total cost of \$1,299.84, the unit cost being 63 cents.

#### *Money statement.*

July 1, 1906, balance unexpended	\$5, 938. 23
Amount appropriated by river and harbor act approved March 2, 1907.	18, 000. 00
	<b>23, 938. 23</b>
June 30, 1907, amount expended during fiscal year:	
For works of improvement	\$7, 206. 17
For maintenance of improvement	1, 299. 84
	<b>8, 506. 01</b>
July 1, 1907, balance unexpended	15, 432. 22
July 1, 1907, outstanding liabilities	1, 863. 69
	<b>13, 568. 53</b>
Amount (estimated) required for completion of existing project	<b>28, 800. 00</b>
<div> <div> <div> Amount that can be profitably expended in fiscal year ending June 30, 1909, for works of improvement, in addition to the balance unexpended July 1, 1907 Submitted in compliance with requirements of sundry civil act of June 4, 1897. </div> </div> </div>	
	<b>20, 000. 00</b>



## APPROPRIATIONS.

June 14, 1880 .....	\$15,000	August 18, 1894 .....	\$6,000
March 3, 1881 .....	10,000	June 3, 1896 .....	6,000
August 2, 1882 .....	4,400	March 3, 1899 .....	3,000
July 5, 1884 .....	6,000	June 13, 1902 (allotment) .....	9,000
August 5, 1886 .....	15,000	March 3, 1905 (allotment) .....	13,800
August 11, 1888 .....	15,000	March 2, 1907 (allotment) .....	18,000
September 19, 1890 .....	12,500		
July 13, 1892 .....	10,000	Total .....	143,700

## COMMERCIAL STATISTICS, 1906.

Articles.	Quantity.	Value.
Outward freights:	<i>Tons.</i>	
Naval stores .....	6,000	\$180,000
Cotton .....	2,750	550,000
Timber, lumber, etc. ....	200,000	1,000,000
Fish, game, vegetables, etc. ....	750	75,000
Rice and rice flour .....	1,870	115,000
Miscellaneous .....	2,550	250,000
Total .....	213,920	2,170,000
Inward freights: Fertilizers, railroad supplies, etc. ....	81,000	1,550,000
Grand total .....	244,920	3,720,000

## (B) LITTLE PEDEE RIVER.

A hand force with a deck lighter began operations on the stream in March, 1907, and during March and April removed from the channel 1,180 obstructions and from the banks 241 trees and 57 cords of brush, at a unit cost of 45 cents. Work was done between 5 and 46 miles above the mouth, and was suspended because the obstructions in the way of navigation at that time had been removed.

*Money statement.*

July 1, 1906, balance unexpended .....	\$313.52
Amount appropriated by river and harbor act approved March 2, 1907 .....	2,000.00
	<u>2,313.52</u>
June 30, 1907, amount expended during fiscal year, for maintenance of improvement .....	666.53
July 1, 1907, balance unexpended .....	<u>1,646.99</u>
Amount (estimated) required for completion of existing project .....	29,300.00

## APPROPRIATIONS.

August 11, 1888 .....	\$5,000	June 13, 1902 (allotment) .....	\$1,500
September 19, 1890 .....	5,000	March 3, 1905 (allotment) .....	1,200
July 13, 1892 .....	5,000	March 2, 1907 (allotment) .....	2,000
August 18, 1894 .....	4,000		
June 3, 1896 .....	3,000	Total .....	26,700

## COMMERCIAL STATISTICS, 1906.

Articles.	Quantity.	Value.
<b>Outward freights:</b>	<i>Tons.</i>	
Naval stores.....	280	\$12,000
Cotton.....	450	99,000
Timber, lumber, cross-ties, etc.....	12,000	60,000
Total.....	12,730	171,000
<b>Inward freights:</b>		
Fertilizers.....	2,750	82,500
Merchandise, railroad supplies, etc.....	3,400	136,000
Total.....	6,150	218,500
Grand total.....	18,880	389,500

## N 2.

## IMPROVEMENT OF LYNCHS RIVER AND CLARKES CREEK, SOUTH CAROLINA.

Preparations were begun for sending the snag boat *Little Pedee* to clear the channel. It will begin operations early in July. The expenditures were for preparing the plant.

*Money statement.*

Amount appropriated by river and harbor act approved March 2, 1907.....	\$2,000.00
June 30, 1907, amount expended during fiscal year, for works of improvement.....	144.58
July 1, 1907, balance unexpended.....	1,855.42
July 1, 1907, outstanding liabilities.....	278.50
July 1, 1907, balance available.....	1,576.92

## APPROPRIATIONS.

August 11, 1888.....	\$2,500	March 2, 1907.....	\$2,000
September 19, 1890.....	2,500		
July 13, 1892.....	2,500	Total.....	9,500

## N 3.

## IMPROVEMENT OF GREAT PEDEE RIVER, SOUTH CAROLINA.

For obtaining the 3½-foot channel between Cheraw and Pedee Station \$19,195.78 was expended. The newly constructed dipper dredge *Reid Whitford* began operations on July 23 at Thompson Creek, just below Cheraw. The material was very troublesome, consisting of rock, pebbles, and hard, sticky clay; dynamite was extensively used to loosen it. The cubic yards removed were 29,335.

Other shoals were dredged, as follows: Mother Griffin, 41,812 cubic yards; Jacobs Island, 7,036 cubic yards; Terrels shoal, 9,947 cubic yards; Cheraw Bay, 17,848 cubic yards.

Total at all shoals, 105,978 cubic yards, at 17 cents per yard. The high unit cost is due to the nature of the material at Thompson Creek; but it is about 10 cents less than the estimated cost.

A small stern-wheel steamer to act as a wood boat and tender for the dredge is under construction.

### *Money statements.*

July 1, 1906, balance unexpended.....	\$39,998. 19
Amount appropriated by river and harbor act approved March 2, 1907.....	20,000. 00
Amount appropriated by sundry civil act approved March 4, 1907.....	30,000. 00
Received account refund of overpayment.....	. 28
	<hr/> 89,998. 47
June 30, 1907, amount expended during fiscal year:	
For works of improvement.....	\$19,195. 78
For maintenance of improvement.....	314. 60
	<hr/> 19,510. 38
July 1, 1907, balance unexpended.....	70,488. 09
July 1, 1907, outstanding liabilities.....	2,334. 45
	<hr/>
July 1, 1907, balance available.....	68,153. 64
Amount (estimated) required for completion of existing project.....	11,300. 00

### APPROPRIATIONS.

June 14, 1880.....	\$7,000. 00	March 3, 1903.....	\$40,000. 00
March 3, 1881.....	6,000. 00	April 28, 1904.....	10,000. 00
August 2, 1882.....	6,000. 00	March 3, 1905.....	15,000. 00
July 5, 1884.....	8,000. 00	March 3, 1905.....	5,000. 00
August 5, 1886.....	20,000. 00	March 2, 1907.....	20,000. 00
August 11, 1888.....	20,000. 00	March 4, 1907.....	30,000. 00
September 19, 1890.....	12,500. 00		
July 13, 1892.....	10,000. 00	Total appropriations.....	254,000. 00
August 18, 1894.....	6,000. 00	Refundment of overpay-	
June 3, 1896.....	12,000. 00	ment.....	. 28
March 3, 1899.....	4,000. 00		
June 13, 1902.....	22,500. 00	Total receipts.....	254,000. 28

### COMMERCIAL STATISTICS, 1906.

Articles.	Quantity.	Value.
Outward freights:	<i>Tons.</i>	
Naval stores.....	500	\$19,540
Cotton.....	1,550	817,580
Lumber, timber, etc.....	150,600	493,675
Rice.....	100	4,200
Miscellaneous.....	1,500	53,000
Total.....	154,250	887,975
Inward freights, miscellaneous merchandise, and fertilizers.....	21,000	863,500
Grand total.....	175,250	1,751,475

## N 4.

## IMPROVEMENT OF WINYAH BAY, SOUTH CAROLINA.

Dredging was carried on during the entire year in the entrance channel and in the eastern channel in the upper bay leading to Georgetown by the U. S. dredge *Winyah Bay*. It removed from the jetty channel 253,991 cubic yards of material; from the eastern channel 157,812 cubic yards, and from the Sampit River shoal at Georgetown, 5,285 cubic yards, a total of 417,088 cubic yards. From January 26 till February 28 the dredge was at Charleston undergoing the annual repairs.

The expenditures for this dredging were as follows: *Winyah Bay* while at work, pay roll, \$11,142.53; coal for boilers, 1,026 tons, \$5,267.55; coal for galley, \$60.15; water, \$69.33; supplies, subsistence, \$2,676.36; supplies, engine, \$1,185.93; other supplies, \$354.31; renewals of or addition to outfit, \$1,099.77; ordinary repairs, \$1,186.48; laundry, ice, miscellaneous expenses, \$329.61; total, \$23,372.02.

*Winyah Bay* while undergoing repairs, pay roll, \$973.68; supplies, subsistence, \$184.75; renewals of or addition to outfit, \$74.40; extraordinary repairs, \$3,279.28; total, \$4,512.11.

For surveys, superintendence, office expenses, care of property, repairs to wharves and coal bins after storms of September and October, 1906, and other general expenses, \$10,579.59.

The total expenditures aggregate \$38,463.72.

The cost per cubic yard is as follows: Actual operating expenses, 5.60 cents; extraordinary repairs, 1.08 cents; general expenses, 2.54 cents; total, 9.22 cents.

The results of this dredging have been to obtain a good 15-foot low-water channel between the jetties, at least 400 feet wide, and generally 500 feet wide, which with a little more work could be easily converted into an 18-foot channel. In the upper bay the depth is 15 feet with the widths generally 400 feet. As the material in this vicinity is soft mud, the depths can be a foot or two less than in the jetty channels for the same draft of vessel. The channel in this soft mud is maintaining itself well, requiring only a small amount of periodical dredging.

Dredging was carried on at the Sampit River shoals for a short while by dredge *No. 3* and then by dredge *No. 1*. The shoal opposite the Winyah Lumber Company's plant was dredged to a depth of 15 feet at mean low water and 400 feet wide, and dredging was in progress at the end of the year, range *No. 1*, at the outer end of the Sampit River. The work was retarded by the hard material in the upper shoal and by logs and stumps in the lower. Extensive repairs were also made to dredge *No. 1*. The yardage removed during the year was 86,664, besides 3,819 stumps and 141 logs. The expenditure was \$31,718.75. Cost per cubic yard, 36 cents. It is proposed to do the remainder of the dredging at mouth of Sampit River by contract, and to dredge with dredge *No. 1* farther up the river to obtain the project width in the harbor.

To mark the end of the south jetty the stone mound, previously constructed, and knocked down by the storms to about the low-water level, was rebuilt by contract. The top is 12 feet above mean low water; the crest is 50 feet long and 30 feet wide. The stone varied

from 3 to 8 tons. The expenditures were as follows: Paid the contractor, \$24,511.57 for 6,221.21 tons of stone, at \$3.94 per ton; superintendence and inspection, \$1,263.49; total, \$25,775.06.

The mud dike at South Island was raised where it was below the general grade, and strengthened at weak sections; 1,054 cubic yards of material were used, and the expenditures were \$1,351.36—\$1.28 per cubic yard. Sod was also placed where needed on the mud dike and the cofferdam dike, 7,390 square yards, at an expenditure of \$1,687.26—22 cents per square yard. Total expenditures for dike, \$3,038.62. It is not proposed to do any more work on this dike beyond maintaining it in good condition.

The following general expenditures were made: On account of dredge *Reid Whitford*, before leaving for the Pedee River, \$788.63; repairs and care of plant at North Island and Smithville; expenses of inspection boat *Carolina*; expenses of survey launch *Winyaw* and other minor charges, \$2,502.13.

#### *Money statement.*

July 1, 1906, balance unexpended.....	\$118,418.29
Amount appropriated by river and harbor act approved March 2, 1907.....	30,000.00
Amount appropriated by sundry civil act approved March 4, 1907.....	72,750.00
Received account sales at auction.....	463.38
	<hr/>
	221,631.67
June 30, 1907, amount expended during fiscal year:	
For works of improvement.....	\$71,940.59
For maintenance of improvement.....	30,346.32
	<hr/>
	102,286.91
July 1, 1907, balance unexpended.....	119,344.76
July 1, 1907, outstanding liabilities.....	8,452.86
	<hr/>
July 1, 1907, balance available.....	110,891.90

#### APPROPRIATIONS.

August 5, 1886.....	\$18,750.00	April 28, 1904.....	\$70,000.00
August 11, 1888.....	100,000.00	March 3, 1905.....	75,000.00
September 19, 1890.....	100,000.00	March 3, 1905.....	10,000.00
July 13, 1892.....	100,000.00	March 2, 1907.....	30,000.00
August 18, 1894.....	110,000.00	March 4, 1907.....	72,750.00
June 3, 1896.....	20,000.00		
June 4, 1897.....	350,000.00	Total appropria-	
July 1, 1898.....	450,000.00	tions.....	2,485,000.00
March 3, 1899.....	58,500.00	Received on account of	
June 6, 1900.....	285,000.00	auction sales, rent of	
March 3, 1901.....	500,000.00	dredge, etc.....	6,247.74
June 28, 1902.....	35,000.00		<hr/>
March 3, 1903.....	100,000.00	Total receipts.....	2,491,247.74

#### CONTRACT IN FORCE.

Name of contractor: Roderick G. Ross.

Contract for constructing mound, south jetty, Winyah Bay, South Carolina.

Price: \$3.94 per ton for stone in place.

Date of contract: June 30, 1906.

Date of beginning: July 17, 1906.

Date of completion: December 31, 1906.

## COMMERCIAL STATISTICS, 1906.

*Arrivals and clearances of vessels and commerce at Georgetown, S. C., January 1 to December 31, 1906.*

	Arrived.			Cleared.		
	Number.	Tonnage.	Crew.	Number.	Tonnage.	Crew.
Coastwise American vessels .....	781	1,026,586	12,443	710	936,400	12,074
Foreign ports:						
American vessels .....	1	263	6	3	917	21
Foreign vessels .....	1	259	6	2	518	14
Total .....	783	1,027,108	12,455	715	937,835	12,109

*Commerce through Winyah Bay, South Carolina, calendar year 1906.*

Articles.	Quantity.	Value.
Outward freights:	<i>Tons.</i>	
Naval stores.....	14,040	\$499,572
Cotton.....	2,435	535,700
Rice.....	670	67,390
Lumber, timber, cross-ties, shingles.....	330,430	2,913,089
Miscellaneous.....	1,355	1,750,000
Total.....	348,930	5,755,751
Inward freights: Miscellaneous.....	43,840	4,384,000
Grand total.....	392,770	10,139,751

## N 5.

## IMPROVEMENT OF MINGO CREEK, SOUTH CAROLINA.

The balance of \$122.31 of the allotment of \$300 from the emergency appropriation provided by the river and harbor act of March 3, 1905, was used in removing obstructions and overhanging trees from the channel.

*Money statement.*

July 1, 1906, balance unexpended.....	\$122.31
June 30, 1907, amount expended during fiscal year, for maintenance of improvement .....	122.31

## APPROPRIATIONS.

August 11, 1888 .....	\$5,000	March 3, 1905 (allotment) .....	\$300
September 19, 1890 .....	5,000		
July 13, 1892 .....	3,000	Total.....	17,300
August 18, 1894 .....	4,000		

## N 6.

## IMPROVEMENT OF SANTEE, WATEREE, AND CONGAREE RIVERS, SOUTH CAROLINA.

## (A) SANTEE RIVER.

The U. S. dredge *No. 2* worked in the Estherville-Minim Creek Canal from July through December, 1906, and in June, 1907. At first it was dredging at the Winyah Bay end, in connection with a

towboat (either the *Waccamaw* or *Little Pedee*) and two side dump lighters to form a 6-foot channel and a silting basin in the bay. Then it redredged at shoal places in the canal. The expenditure was \$3,680.83; 37,500 cubic yards having been removed, at a cost of 9 cents per cubic yard.

The digging of the line canal between the Government property and the adjacent plantation on the south was continued. A distance of 4,650 feet was dug, at a cost of \$318.75.

The rebuilding of the snag boat *Great Pedee*, which was under way at the beginning of the year, was completed and the boat was placed at work. For the hull and housing, and for transferring and repairing the machinery, \$4,070 was spent; and for outfit, testing, and superintendence an additional \$1,480.84, making a total of \$5,550.84.

The other expenditures were for repairs to dredge *No. 1*, \$1,997.55; care of and repairs to property at Smithville and Daisy Bank, building shelter for machinery, improving sawmill, marine railway at Smithville, general superintendence, \$2,794.90.

#### Money statement.

July 1, 1906, balance unexpended.....	\$18, 227. 51
Amount appropriated by river and harbor act approved March 2, 1907.....	33, 000. 00
	<hr/> 51, 227. 51
June 30, 1907, amount expended during fiscal year,—for maintenance of improvement.....	14, 342. 87
July 1, 1907, balance unexpended.....	36, 884. 64
July 1, 1907, outstanding liabilities.....	626. 50
July 1, 1907, balance available.....	<hr/> 36, 258. 14
Amount (estimated) required for completion of existing project.....	<hr/> 100, 000. 00
<hr/>	
{ Amount that can be profitably expended in fiscal year ending June 30, 1909, for works of improvement, in addition to the balance unexpended July 1, 1907.....	25, 000. 00
{ Submitted in compliance with requirements of sundry civil act of June 4, 1897.....	

#### APPROPRIATIONS.

March 3, 1881.....	\$22, 000. 00	June 13, 1902.....	\$15, 000. 00
August 3, 1882.....	20, 000. 00	June 13, 1902 (allotment).....	7, 000. 00
July 15, 1884.....	15, 000. 00	March 3, 1905 (allotment).....	25, 000. 00
August 5, 1886.....	18, 750. 00	March 2, 1907 (allotment).....	33, 000. 00
August 11, 1888.....	24, 000. 00		
September 19, 1890.....	30, 000. 00	Total appropriations.....	347, 750. 00
July 13, 1892.....	30, 000. 00	Account of sales at auction, etc.....	32. 50
August 18, 1894.....	40, 000. 00		
June 3, 1896.....	48, 000. 00	Total receipts.....	347, 782. 50
March 3, 1899.....	20, 000. 00		

#### CONTRACT IN FORCE.

Name of contractor: Cooperative Building and Manufacturing Company, Georgetown, S. C.

For: Two boat hulls.

Price: \$7,000 (with deductions for lumber furnished by United States).

Date of contract: March 14, 1906.

Date of beginning: March 24, 1906.

Date of expiration: May 28, 1906. (Time limit waived.)

## COMMERCIAL STATISTICS, 1906.

Articles.	Quantity.	Value.
<b>Outward freights:</b>	<i>Tons.</i>	
Naval stores .....	10,000	\$220,000
Cotton .....	800	90,000
Lumber, timber, and cord wood .....	400,000	560,000
Cross-ties .....	2,000	10,000
Rice .....	2,000	10,000
Fish and game .....	2,000	20,000
Miscellaneous .....	4,000	220,000
<b>Total.</b> .....	420,800	1,130,000
<b>Inward freights, miscellaneous.</b> .....	7,000	700,000
<b>Grand total</b> .....	427,800	1,830,000

\* Of this, 4,100 tons, valued at \$578,100, is through freight for the Congaree River, South Carolina.

## (B) WATEREE RIVER.

The construction of the new snag boat *Wateree*, reported under way in the last annual report, was completed. After equipping the boat it was given a thorough test in the neighborhood of Georgetown and was then sent to the Wateree River, arriving at the mouth May 30, 1907. There were removed from the river during the remainder of the year the following obstructions: From the banks, 249 trees and 10 cords of brush; from the channel, 101 logs, 178 stumps, and 1 cord small snags. The unit cost for this work was \$1.95.

The expenditures for the year were \$14,384.74, divided as follows: Construction of snag boat, \$9,404; testing snag boat, making improvements, and purchase of outfit and supplies, \$3,927.12; actual snagging, \$1,053.62.

*Money statement.*

July 1, 1906, balance unexpended .....	\$21,912.38
Amount appropriated by river and harbor act approved March 2, 1907 .....	50,000.00
	<hr/> 71,912.38
June 30, 1907, amount expended during fiscal year, for maintenance of improvement .....	14,384.74
	<hr/> 57,527.64
July 1, 1907, balance unexpended .....	57,527.64
July 1, 1907, outstanding liabilities .....	1,628.45
	<hr/> 55,899.19
{ Amount that can be profitably expended in fiscal year ending June 30, 1909, for maintenance of improvement, in addition to the balance unexpended July 1, 1907 .....	25,000.00
{ Submitted in compliance with requirements of sundry civil act of June 4, 1897, and of section 7 of the river and harbor act of 1890.	

## APPROPRIATIONS.

March 3, 1881 .....	\$8,000	August 18, 1894 .....	\$2,500
August 2, 1882 .....	15,000	June 3, 1896 .....	5,000
July 5, 1884 .....	5,000	March 3, 1899 .....	2,500
August 5, 1886 .....	7,500	March 3, 1905 (allotment) .....	25,000
August 11, 1888 .....	12,000	March 2, 1907 (allotment) .....	50,000
September 19, 1890 .....	12,500		
July 13, 1892 .....	2,500	<b>Total</b> .....	<hr/> 147,500



## CONTRACT IN FORCE.

Name of contractor: Cooperative Building and Manufacturing Company, Georgetown, S. C.

For: Two boat hulls.

Price: \$7,000 (with deductions for lumber furnished by United States).

Date of contract: March 14, 1906.

Date of beginning: March 24, 1906.

Date of expiration: May 28, 1906. (Time limit waived.)

## COMMERCIAL STATISTICS, 1906.

Articles.	Quantity.	Value.
	<i>Tons.</i>	
Outward freights: Timber .....	16,200	\$81,000

## (C) CONGAREE RIVER.

The reconstructed snag boat *Great Pedee* began work on this stream in December, 1906, and has been employed thereon ever since. It has snagged between the mouth of the river and 46 miles above, shortly below the lock and dam, with a view to removing the snags in the channel that were in the way of passing steamboats. It is expected that the entire channel will be cleared in a few months. Since December 2,378 obstructions have been removed; the expenditures were \$6,089.60, the unit cost being \$2.52.

As the shoal at Barbours Cut, composed of sand and pebbles, was a serious obstruction to navigation, U. S. dredge *No. 3* was sent there in August, 1906, to remove it. The number of cubic yards removed was 10,859, at an expenditure of \$4,323.73—39 cents per cubic yard. The cost was greatly increased by the wrecking of the A frame, which required one month to repair it. The dredge is a small dipper dredge, and this test has proved that it is unsuited for dredging in this river. It is proposed to construct a hydraulic dredge for this stream.

A channel 150 feet wide is being cleared in the ledge rock and boulders above the lock to the proposed steamboat landing at the foot of Senate street, Columbia. A provisional channel 100 feet wide has been almost obtained, and a new and more powerful derrick boat is in process of construction, with which it is hoped the entire width will be shortly secured. The boat will be 80 feet long by 28 feet wide, strongly constructed of yellow pine lumber; the hoisting engine will have 10-inch by 13-inch double cylinders, and the bucket will be a 1½ cubic yard orange peel of the Heyward type. The expenditures have been:

Clearing channel, \$9,036.91; materials for and construction of derrick boat, \$2,745.35; repairs to steamer *Waccamaw*, which will be used to tow loaded lighters, \$1,357.04; total, \$13,139.30.

*Money statement.*

July 1, 1906, balance unexpended.....	\$20,297. 87
Amount appropriated by river and harbor act approved March 2, 1907.....	67,000. 00
	<hr/> 87,297. 87
June 30, 1907, amount expended during fiscal year:	
For works of improvement.....	\$17,463. 03
For maintenance of improvement.....	6,089. 60
	<hr/> 23,552. 63
July 1, 1907, balance unexpended.....	63,745. 24
July 1, 1907, outstanding liabilities.....	5,016. 19
	<hr/>
July 1, 1907, balance available.....	58,729. 05

## APPROPRIATIONS.

August 5, 1886.....	\$7,500. 00	March 2, 1907 (allotment) ..	\$67,000. 00
August 11, 1888.....	7,500. 00		
September 19, 1890.....	5,000. 00	Total appropriations.....	128,000. 00
July 13, 1892.....	5,000. 00	Refunded on account of	
August 18, 1894.....	4,000. 00	overpayment.....	. 50
June 3, 1896.....	2,000. 00		
June 13, 1902 (allotment) ..	5,000. 00	Total.....	128,000. 50
March 3, 1905 (allotment) ..	25,000. 00		

## COMMERCIAL STATISTICS, 1906.

Articles.	Quantity.	Value.
Outward freights:	<i>Tons.</i>	
Timber.....	31,200	\$172,000
Cotton.....	50	11,000
Miscellaneous general merchandise.....	172	60,000
Total.....	31,422	243,000
Inward freights: Miscellaneous general merchandise.....	4,100	578,100
Grand total.....	35,522	821,100

## N 7.

IMPROVEMENT OF CONGAREE RIVER, SOUTH CAROLINA, FROM  
GERVAIS STREET BRIDGE, COLUMBIA, TO GRANBY.

During the year work was in progress of clearing the channel between the lock and the city of Columbia until the appropriation was exhausted. It was then carried on under allotments for Congaree River (see (C) Congaree River, above). The work was done by hired labor using Government plant. Boulders and ledge rock have been removed. About 2,362 tons of stone were placed on the bank below the abutment to protect it from scour and as a barrier in the channel above the lock.

*Money statement.*

July 1, 1906, balance unexpended.....	\$3,761. 95
Received account of overpayment.....	. 14
	<hr/> 3,762. 09
June 30, 1907, amount expended during fiscal year, for works of improvement.....	3,762. 09

## APPROPRIATIONS.

March 3, 1899.....	\$50,000.00
June 6, 1900.....	100,000.00
March 3, 1901.....	50,000.00
June 28, 1902.....	50,000.00
Refunded on account of overpayment.....	.14
Total.....	250,000.14
Transferred to Congaree River.....	25,000.00
	<hr/> 225,000.14

## N 8.

## OPERATING AND CARE OF LOCK AND DAM ACROSS CONGAREE RIVER, NEAR COLUMBIA, SOUTH CAROLINA.

An allotment of \$6,000 was made June 15, 1906, for the operating and care of this lock and dam. A permanent force of an overseer and four laborers is maintained, and additional labor is hired whenever required. The expenditures during the fiscal year were as follows:

## Services:

Overseer and administration.....	\$1,400.00
Laborers.....	2,550.67
Office force.....	114.64
	<hr/> 4,065.31

## Materials:

Office expenses.....	\$80.79
Supplies.....	36.82
Repairs to dwelling, and pump for fire protection.....	43.22
Repairs to aprons in dam.....	52.59
Diving outfit.....	340.00
	<hr/> 553.42
	<hr/> 4,618.73

## N 9.

## IMPROVEMENT OF INLAND WATERWAYS BETWEEN CHARLESTON HARBOR, SOUTH CAROLINA, AND OPPOSITE McCLELLANVILLE.

At the beginning of the fiscal year the firm with which a contract had been made for dredging at 21.4 cents per cubic yard, place measurement, had withdrawn the dredge for extensive alterations. Dredging was resumed in October, but satisfactory progress was not made until December. Spanish Fort and the marsh cut in the rear of Sullivan's Island were dredged to the proper dimensions, and the dredging has been carried on in Hamlin Creek behind the Isle of Palms. About 37,000 cubic yards were removed during the year.

As the balance of the sum estimated to complete the project (\$75,290) was appropriated by the last Congress, proposals were invited for dredging the remainder of the channel. The only bid received was regarded as excessive and was rejected. New proposals will be invited.

The expenditures during the year were \$9,649.39, divided as follows: Dredging, \$6,040.51; surveys, \$2,075.68; office expenses, \$1,533.20.

*Money statement.*

July 1, 1906, balance unexpended.....	\$41,800.51
Amount appropriated by river and harbor act approved March 2, 1907.....	75,290.00
	<hr/> 117,090.51
June 30, 1907, amount expended during fiscal year, for works of improvement .....	9,649.39
July 1, 1907, balance unexpended.....	107,441.12
July 1, 1907, outstanding liabilities.....	1,253.30
	<hr/> 106,187.82
July 1, 1907, balance available.....	32,227.55
July 1, 1907, amount covered by uncompleted contracts.....	

APPROPRIATIONS.

Act of June 13, 1902.....	\$50,000
Act of March 2, 1907.....	75,290
Total .....	<hr/> 125,290

CONTRACT IN FORCE.

Name of contractor: Simons-Mayrant Company, Charleston, S. C.  
 For: Dredging.  
 Price: Twenty-one and four-tenths cents per cubic yard.  
 Date of contract: October 30, 1905.  
 Date of beginning: February 14, 1906.  
 Date of expiration: Indefinite; exhaustion of appropriation.

COMMERCIAL STATISTICS, 1906.

Articles.	Quantity.	Value.
<b>Toward McClellanville:</b>	<i>Tons.</i>	
Fertilizers .....	2,580	\$46,440
Stable manure .....	850	1,700
Oysters in shell .....	4,100	9,600
Miscellaneous, general merchandise .....	2,500	180,000
Total.....	<hr/> 10,030	<hr/> 237,740
<b>Toward Charleston:</b>		
Sea-island cotton .....	221	132,600
Short cotton .....	95	21,500
Cotton seed .....	78	1,170
Vegetables .....	2,310	102,000
Palms .....	11	220
Lumber .....	10,000	83,000
Turpentine .....	900	90,000
Rosin .....	2,410	50,000
Clams .....	78	1,175
Oysters in shell .....	16,500	45,000
Canned goods .....	200	20,000
Cord wood .....	4,095	7,240
Oyster shells .....	2,500	5,000
Beef, mutton, fish, and game .....	17	1,102
Total.....	<hr/> 39,410	<hr/> 560,007
Grand total, both ways .....	<hr/> 49,440	<hr/> 797,747

## N 10.

## IMPROVEMENT OF HARBOR AT CHARLESTON, SOUTH CAROLINA.

Work was done during the year by the U. S. dredge *Gen. Abbot*, which dredged in the entrance channels to Charleston Harbor. At the beginning of the fiscal year the dredge was undergoing alterations and repairs at the Norfolk (Va.) Navy-Yard. It resumed work August 16, 1906, and was withdrawn September 29, 1906, as the appropriations for the work were about exhausted. It was transferred to the New Orleans (La.) engineer office and has been at work at the South Pass and South West Pass, mouth of the Mississippi River. The number of cubic yards removed by it at Charleston during August and September were 143,411.

The U. S. dredge *Charleston*, which belongs to this work, was away the entire year at work under the Montgomery, Ala., and Mobile, Ala., engineer offices.

The expenditures during the year were \$23,942.45, divided as follows:

On account of dredge <i>Gen. Abbot</i> .....	\$20, 187. 62
Surveys and superintendence.....	2, 279. 62
Office expenses .....	308. 54
Wharf rent .....	1, 166. 67
Total.....	23, 942. 45

The expenses of the dredge *Gen. Abbot* were as follows: Operating expenses while dredging in Charleston Harbor, \$4,475.78; ship's expenses while undergoing repairs at Norfolk Navy-Yard, \$4,834.81; navy-yard bill for extraordinary repairs, \$9,098.28; navy-yard bill for alterations and additions, \$660.66; supplies placed on board before transferring to New Orleans, \$338.72.

A survey is now in progress to determine readjustment of the harbor lines of the city of Charleston.

At the expiration of the dredging in September, 1906, a survey was made, and in June, 1907, a survey was made to determine what changes had taken place in the channel. Beyond the jetties on the Cummings Point range the narrowest point of the 26-foot low-water channel is 800 feet, as against 720 feet of a year ago, and at the outer end the width is over 1,200 feet. Between the jetties on the Fort Sumter-St. Philip range there has been little change. The width is generally 600 feet and over, except that for a distance of 700 feet to the eastward of the junction of the Mount Pleasant and the Fort Sumter-St. Philip ranges the width is 550 feet. The central depths are greater than 26 feet. There exists an unbuoyed channel 28 feet deep at low water.

The only deleterious effect the nine months' cessation in dredging has had upon the channel is the working down upon the range of the shoal on the north side of the channel at the end of the jetties. Since October this shoal has advanced about 250 feet and is now only a short distance from the range. The shoalest sounding on it is 24.4 feet. With a small portion of the appropriation made by the last river and harbor bill for this harbor it will shortly be removed.

The range across the outer bar, known as the Cummings Point range, was moved by the Light-House Board during the year in order to throw the point of intersection of this range and the Fort Sumter-St. Philip range farther away from the encroaching shoal.

*Money statement.*

July 1, 1906, balance unexpended.....	\$23,419.96
Received account sales.....	1,210.61
Amount appropriated by river and harbor act approved March 2, 1907.....	25,000.00
	49,630.57
June 30, 1907, amount expended during fiscal year, for works of improvement.....	23,942.45
July 1, 1907, balance unexpended.....	25,688.12
July 1, 1907, outstanding liabilities.....	14.47
July 1, 1907, balance available.....	25,673.65
Amount that can be profitably expended in fiscal year ending June 30, 1909, for maintenance of improvement, in addition to the balance unexpended July 1, 1907.....	
Submitted in compliance with requirements of sundry civil act of June 4, 1897, and of section 7 of the river and harbor act of 1899.	
	25,000.00

APPROPRIATIONS.

June 18, 1878.....	\$200,000.00	June 28, 1902.....	\$50,000.00
March 3, 1879.....	200,000.00	March 3, 1903.....	60,000.00
June 14, 1880.....	170,000.00	April 28, 1904.....	73,000.00
March 3, 1881.....	175,000.00	March 3, 1905.....	25,000.00
August 2, 1882.....	300,000.00	March 3, 1905.....	25,000.00
July 5, 1884.....	250,000.00	March 2, 1907.....	25,000.00
August 5, 1886.....	187,500.00		
August 11, 1888.....	350,000.00	Total appropriations.....	4,650,500.00
September 19, 1890.....	370,000.00	Received for rent of dredge, account sales at auction, and account overpayments.....	7,485.30
July 13, 1892.....	225,000.00		
March 3, 1893.....	750,000.00	Total receipts.....	4,657,985.30
August 18, 1894.....	450,000.00		
March 2, 1895.....	500,000.00		
June 6, 1900.....	220,000.00		
June 13, 1902.....	45,000.00		

EMERGENCY CONTRACT IN FORCE.

Name of contractor.	Contract for—	Price each.	Date of—		
			Contract.	Beginning.	Expiration.
Charleston Terminal Co..	Lease of wharf.....		May 31, 1904	May 1, 1904	Apr. 30, 1907

## COMMERCIAL STATISTICS.

*Arrivals and clearances of vessels and commerce at Charleston Harbor, South Carolina, January 1 to December 31, 1906.*

	Arrived.			Cleared.		
	Number.	Tonnage.	Crew.	Number.	Tonnage.	Crew.
Coastwise:						
American vessels .....	789	1, 880, 960	21, 911	19	12, 784	232
Foreign vessels .....				67	120, 823	1, 654
Foreign ports: Foreign vessels .....	110	132, 400	2, 144	39	21, 068	895
Total .....	849	1, 513, 360	24, 065	125	154, 616	2, 721

Value of exports .....	\$1, 171, 407. 00
Value of imports .....	2, 994, 160. 00
Duties collected .....	21, 166. 53

*Commerce through Charleston Harbor, ocean entrance, calendar year 1906.*

Articles.	Tons of 2,000 pounds.	Value.	Articles.	Tons of 2,000 pounds.	Value.
IMPORTS.			EXPORTS.		
Muriate of potash .....	11, 059	\$424, 478	Lumber .....	179, 448	\$1, 268, 563
Kainit .....	71, 234	541, 677	Kainit .....	199	2, 686
Nitrate of soda .....	18, 723	904, 350	Phosphate rock .....	11, 677	47, 875
Sulphate of potash .....	1, 894	82, 578	Manipulated fertilizers .....	1, 762	44, 050
Manure salt .....	2, 956	49, 489	Acid phosphate .....	5, 763	33, 138
Pyrites .....	76, 756	441, 352	Clay .....	20, 377	100, 000
Guano .....	11, 948	881, 141	Cotton, upland .....	35, 844	7, 391, 610
Tankage .....	1, 839	45, 975	Cotton, sea-island .....	1, 984	992, 000
Fish scrap .....	12, 117	368, 432	Cotton goods .....	48, 683	24, 341, 500
Fertilizer material .....	3, 812	76, 540	Cotton-factory sweepings and lint .....	1, 313	183, 820
Cement .....	26, 009	239, 578	Cotton-seed oil .....	591	57, 262
Jute butts .....	2, 409	119, 143	Rice .....	1, 151	80, 570
Refined oil and gasoline .....	8, 597	170, 336	Naval stores .....	3, 008	123, 990
Coal .....	84, 955	233, 870	Miscellaneous .....	7, 580	230, 278
Salt .....	3, 580	25, 060			
Rice .....	835	48, 000			
Fruit .....	8, 030	287, 967			
Coffee .....	1, 167	210, 600			
Refined sugar .....	1, 780	173, 000			
Miscellaneous .....	166, 851	16, 520, 188			
Total .....	516, 500	21, 343, 754	Total .....	318, 880	34, 957, 342

Total imports and exports 835,360 tons, valued at \$56,301,096.

These commercial statistics do not include a large part of the business of Charleston which is done by the railroads, nor the commerce passing over the rivers which enter the harbor, nor over the inland routes to the north and south.





## APPENDIX O.

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IMPROVEMENT OF RIVERS AND HARBORS IN EASTERN GEORGIA,  
OF INSIDE WATER ROUTE BETWEEN SAVANNAH, GEORGIA, AND  
FERNANDINA, FLORIDA, OF CUMBERLAND SOUND, GEORGIA AND  
FLORIDA, AND OF FERNANDINA HARBOR, FLORIDA.

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REPORT OF LIEUT. COL. DAN C. KINGMAN, CORPS OF ENGINEERS,  
OFFICER IN CHARGE, FOR THE FISCAL YEAR ENDING JUNE 30, 1907.

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### IMPROVEMENTS.

- |  |  |
|--|--|
| 1. Savannah Harbor, Georgia.                       | 8. Inside water route between Savannah, Georgia, and Fernandina, Florida.              |
| 2. Savannah River below Augusta, Georgia.          | 9. Skidaway Narrows, Georgia.  |
| 3. Savannah River above Augusta, Georgia.          | 10. Cumberland Sound, Georgia and Florida.   |
| 4. Harbor at Darlen and Doboy Bar, Georgia.        | 11. Fernandina Harbor, Florida.  |
| 5. Altamaha, Oconee, and Ocmulgee rivers, Georgia. | 12. Removing sunken vessels or craft obstructing or endangering navigation—Indefinite. |
| 6. Club and Plantation creeks, Georgia.            |  |
| 7. Brunswick Harbor, Georgia.                      |  |
- 

UNITED STATES ENGINEER OFFICE,  
*Savannah, Ga., July 8, 1907.*

GENERAL: I have the honor to transmit herewith my annual report for the fiscal year ending June 30, 1907, upon the works of river and harbor improvements in my charge.

Very respectfully, your obedient servant,

DAN C. KINGMAN,  
*Lieut. Col., Corps of Engineers.*

Brig. Gen. A. MACKENZIE,  
*Chief of Engineers, U. S. A.*

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### O 1.

#### IMPROVEMENT OF SAVANNAH HARBOR, GEORGIA.

##### OPERATIONS DURING THE FISCAL YEAR ENDING JUNE 30, 1907.

For a detailed history of the work see reports of the Chief of Engineers for 1903, pages 1146-1152; for 1904, pages 1644-1647; for 1905, pages 1260-1262, and for 1906, pages 1187-1190.

The two United States seagoing dredges, *Savannah* and *Cumberland*, have been employed throughout the year in improving and maintaining the harbor of Savannah, except when they were necessarily absent for the purpose of being docked and repaired. The two machines together dredged 980,134 cubic yards of material, measured in their bins, of which the *Savannah* removed 529,247 yards, at a total cost, including repairs, of 10 cents per cubic yard, and the *Cumberland* removed 450,887 yards at a total cost of 14.2 cents per cubic yard. The reason for the smaller output and higher cost, in the case of the *Cumberland*, which is the larger machine of the two, is that it was necessary to send it to Philadelphia and afterwards to Norfolk for the purpose of being docked and repaired, and to again send it to Jacksonville for a similar purpose. The cost of these repairs increased the general expense and the loss of time diminished the output.

Of this material 271,757 cubic yards was dredged from the outer bar, with the result of securing a channel not less than 100 feet wide, and 23 feet deep across the bar. The channel diminishes in depth toward the side ranges. The material removed was at first a very fine, hard, compact sand, but as the excavation proceeded a great deal of tough blue clay, in which small shells were embedded, was encountered. The appearance of this material is encouraging, and indicates that the improvement will be much more stable than would be the case in a shifting sand.

The excavated volume, when determined by place measurement, is but 10 per cent less than when measured in the dredges. A part, and perhaps all, of this excess is due to loosening up the material, which is very hard and compact when in place. Therefore, little if any deposit can have occurred within the dredged area during the year. The result for the whole year is most favorable in this locality, and affords good reason for hope that an ample channel of sufficient depth can be secured upon the bar by dredging alone, and that the cost of maintaining it will be small.

There were taken from Tybee Knoll 364,317 cubic yards of dredged material, mostly from between the jetties. The result has been to secure a channel practically of the project dimensions across the knoll; in fact, the depth is considerably exceeded at most places. Comparative surveys, as in the case of the bar, show an excavation greater in volume than the bin measurements alone would indicate. Last year the increase amounted, within the limits of the dredged area, to about 100 per cent. This year it was much less, being only about 10 per cent. There has, however, been an enormous scour in the whole area between the jetties, amounting in the past two years to very nearly 1,800,000 cubic yards in excess of that removed by the dredges. This is an encouraging feature, and indicates that an ample channel, of almost any desired dimensions, can be secured and easily maintained between the jetties, and that the powerful ebb flow, amounting to more than 2,000,000,000 cubic feet to the tide, is being gathered into a single channel about 1,800 feet in width.

From the river above Tybee Knoll 344,161 cubic yards of material were removed for the purpose of maintaining the improvement. This work was done when the sea was too rough to permit material to be taken outside and dumped, as is done in the case of all dredging from

the bar and from the knoll. Rehandling was necessary in the case of this river dredging, and to accomplish it a small 12-inch stationary pumping dredge was employed at a fixed rate per hour of actual pumping, the material being brought to it by the seagoing dredges. The place selected was at the Venus Point dolphin. Permission was obtained from the owner of the adjacent land to place the material on the marsh. The small pump worked day and night and has put ashore, as nearly as can be estimated, 280,540 cubic yards of material, at a cost for rehandling of 7.8 cents per cubic yard. This method of maintenance is highly satisfactory. It permits the seagoing dredges to be used at times when they could not be otherwise employed. Their operation does not in any way interfere with the navigation of the river, and by their method of work, which is to scrape the bottom, they begin to improve a bad place as soon as they begin to work, while in the case of a machine that cuts the full depth at once no benefit results until a complete cut is made through the obstruction. To enable this method of maintenance to be carried out more rapidly and economically in the future, Congress has authorized the construction of a 20-inch pumping dredge at a cost not to exceed \$125,000. The construction of this machine has been assigned to an officer of the Corps of Engineers who is especially skilled in work of this character.

The particular localities at which dredging for maintenance has been found necessary are as follows: The Upper flats, from which about 70,000 yards were removed; the Lower flats, from which about 119,000 cubic yards were removed; and the Long Island Crossing, from which about 156,000 yards were removed. The reason for special deposit of material at these places is quite evident. The general plan of improvement of Savannah Harbor, which virtually consists in the regulation of the Savannah River, is admirable. The river naturally, from the Cross Tides to the sea, is from 1 to 3 miles wide, increasing to nearly 7 miles at the mouth, divided and subdivided by numerous islands and cross channels, and its natural condition was most unfavorable to the maintenance of a permanent channel of adequate depth. The plan has for its object to unite the ebb-tide flow in a single channel of moderate width, and such that the depths can be maintained by the natural flow of the current. This is secured largely by training walls. The width of the improved channel at the city is about 600 feet, and it gradually increases to 1,800 feet at the mouth. The increase of width is added from time to time and is skillfully arranged to accommodate the return flow from the numerous tidal basins.

While the plan of improvement is admirable, the materials and methods of construction have not always been so. Much of the material is of a perishable nature, and the style of construction is often very light. Above where the action of the teredo would be felt, the training walls consist of double rows of piling filled with brush and weighted with stone; below, they are of rubble mounds resting upon brush mattresses. Most of the stone used was in very small pieces, not sufficient to resist perfectly the waves due even to passing vessels. The brush has settled down between the rows of piles, much of the stone was washed off, and the works are all too low to completely control the flow of the water. The rubble mound jetties are also too low, due in part to leveling off of stone, part to settlement, and part to not having been built high enough originally.

Many of these works, however, have served their purpose; others have not, and this is particularly the case where the ebb-tide current is forced to a crossing from one bank to the other. Here the low relief of the training walls permit a large amount of water to flow over their crest, thereby constantly diminishing the head and retarding the velocity of flow in the improved channel, which in any silt-bearing stream must inevitably lead to a deposit.

These training walls are to be raised. Plans have been prepared and proposals invited for this purpose, but the bids were deemed unreasonably high and were rejected, and the work has been readvertised.

It is of interest to note that since the beginning of the systematic improvement of the harbor of Savannah, in 1873, more than 17,000,000 cubic yards of material, bin measurement, have been dredged from the channel, and that since 1882, or since the present control of the river began to be effective, nearly 6,000,000 cubic yards of material has been washed out by the current, showing that the current, when properly controlled, is a powerful agent, not only for maintenance, but even for increasing the improvement.

As the 28-foot project is now practically completed, and what little remains to be accomplished in the way of increased width is entirely included in and covered by the tentative project adopted by Congress on March 2, 1907, it is therefore possible now to start in with the new project with every prospect of accomplishing results which will be most satisfactory from an engineering standpoint and beneficial to commerce.

The tide gauge observations have been maintained throughout the year, and show no important change from previous conditions.

In addition to the work herein described the plant pertaining to the improvement has been cared for and properly maintained.

Much of the foregoing data is taken from a very complete and interesting report prepared by Assistant Engineer Cooper, in local charge of the work, which I regret that under existing instructions I am not permitted to submit for publication.

Of the total amount expended during the fiscal year, viz, \$283,530.30, the sum of \$64,016.80 was for dredging with the U. S. dredge *Cumberland*, at 14.2 cents per cubic yard, including cost of repairs; \$52,792.65 for dredging with the U. S. dredge *Savannah*, at 10 cents per cubic yard, including repairs; \$7,673.49 for rehandling dredged material under agreement of October 24, 1906, with Savannah Dredging Company, at \$5 per hour of pumping, including cost of board for inspectors, and \$9,578.46 for rehandling dredged material under agreement with the same company, dated March 15, 1907, at \$6.50 per hour of pumping, including board of inspectors; \$1,004 for superintending work under agreement with Savannah Dredging Company; \$23,464.90 for surveys and contingencies; and \$125,000, of the amount appropriated by the river and harbor act of March 2, 1907, which has been placed to the credit of Maj. J. C. Sanford, Corps of Engineers, who has been charged with the duty of constructing the stationary pumping dredge provided for in said act.

## COMMERCE AND NAVIGATION.

Full discussions of the commerce of Savannah were given in the Reports of the Chief of Engineers for 1890, pages 1252 and 1253, and for 1897, page 1497.

The regular lines of steamships established between this port and New York, Boston, Baltimore, and Philadelphia comprise a total of 17 steamers. During the calendar year 1906, 10 of these ran to the two first-named ports and 7 to the last-named two. During the year they made 529 round trips and carried 1,021,850 tons of freight, valued at \$122,986,670. They also handled in and out of Savannah 31,916 passengers.

On the inland waters there are a number of small steamers plying between Savannah and adjacent ports, besides numerous schooners and small sailboats. It is estimated that for the year 1906 this portion of the commerce amounted to 100,000 tons, valued at \$1,500,000.

The chief articles of export are cotton, lumber, and naval stores, of which shipments for the year 1906 were as follows: Of cotton, 1,533,729 bales; of lumber, 245,868,409 feet, and of naval stores, 189,885 barrels of turpentine and 666,003 barrels of rosin.

The total amount of freight received and shipped at the port during 1906 was 3,801,049 tons, valued at \$194,836,773. This is an increase over 1905 of 72,508 tons.

*Money statement.*

July 1, 1906, balance unexpended.....	\$192, 200. 64
Amounts received from proceeds of sales of Government property....	587. 25
Amount appropriated by river and harbor act approved March 2, 1907.....	300, 000. 00
Amount appropriated by sundry civil act approved March 4, 1907....	60, 000. 00
	<hr/> 552, 787. 89
June 30, 1907, amount expended during fiscal year:	
For works of improvement.....	<sup>a</sup> \$216, 284. 21
For maintenance of improvement.....	67, 246. 09
	<hr/> 283, 530. 30
July 1, 1907, balance unexpended.....	269, 257. 59
July 1, 1907, outstanding liabilities.....	12, 683. 34
	<hr/> 256, 574. 25
Amount (estimated) required for completion of existing tentative project.....	700, 000. 00
	<hr/> <hr/>
{ Amount that can be profitably expended in fiscal year ending June 30, 1909, for works of improvement, in addition to the balance unexpended July 1, 1907.....	350, 000. 00
{ Submitted in compliance with requirements of sundry civil act of June 4, 1897.	

<sup>a</sup> This amount includes \$125,000, which has been placed to the credit of Maj. J. C. Sanford, Corps of Engineers, for construction of the pumping dredge.

## AMOUNT AND DATE OF ALL APPROPRIATIONS.

From 1826 up to the date of the 22-foot plan of improvement appropriations amounting to \$667,096.64 were made for the improvement of the harbor and for the removal of wrecks, as follows:

March 18, 1826	\$50,000.00
March 3, 1829	24,490.00
July 3, 1832	25,000.00
March 2, 1833	43.06
March 2, 1833	8,430.62
June 28, 1834	30,000.00
March 3, 1835	20,000.00
July 7, 1838	15,000.00
August 30, 1852	40,000.00
March 3, 1855	161,000.00
June 10, 1872	50,000.00
March 3, 1873	50,000.00
February 27, 1874	193,132.96
Total	667,096.64

Under the 22-foot plan of improvement the following appropriations were made:

June 23, 1874	\$50,000.00
March 3, 1875	70,000.00
August 14, 1876	62,000.00
June 18, 1878	70,000.00
March 1, 1879	100,000.00
June 14, 1880	65,000.00
March 3, 1881	65,000.00
August 2, 1882	200,000.00
July 5, 1884	200,000.00
August 5, 1886	150,000.00
August 11, 1888	180,000.00
	1,212,000.00
Unexpended balance of last appropriation carried to new project	4,035.05
Total	1,207,964.95

Under the 26-foot plan of improvement the following appropriations have been made:

By act of Congress of—	
August 11, 1888 (unexpended balance)	\$4,035.05
September 19, 1890	350,000.00
July 13, 1892	318,750.00
March 3, 1893	1,000,000.00
August 18, 1894	975,000.00
March 2, 1895	856,250.00
	3,504,035.05

Amount deposited by clerk of United States circuit court for the southern district of Georgia, March 20, 1895

500.00

Unexpended balance of last appropriation carried to modified project

44,485.06

Total

3,460,049.99

Under the modified 26-foot project for improving Savannah Harbor the following appropriations have been made:

By act of Congress of—	
March 2, 1895 (unexpended balance) .....	\$44,485.06
June 3, 1896 .....	5,000.00
June 4, 1897 .....	350,000.00
July 1, 1898 .....	450,000.00
March 3, 1899 (sundry civil act) .....	\$200,000.00
March 3, 1899 (river and harbor act) .....	50,000.00
	<hr/> 250,000.00
June 13, 1902 .....	50,000.00
	<hr/> 1,149,485.06
Amount deposited to credit of the appropriation .....	301.41
	<hr/> Total .....
	1,149,786.47
Unexpended balance of last appropriations carried to new project .....	436,867.63
	<hr/> Total .....
	712,918.84

Under the 28-foot plan of improvement the following appropriations have been made:

By act of Congress of—	
June 13, 1902 (unexpended balance from last appropriation) .....	\$436,867.63
March 3, 1903 .....	720,000.00
June 6, 1900 (allotted from emergency appropriation) .....	5,000.00
April 28, 1904 .....	105,000.00
March 3, 1905 (river and harbor act) .....	\$75,000.00
March 3, 1905 (sundry civil act) .....	175,000.00
	<hr/> 250,000.00
September 28, 1905 (allotted from emergency appropriation) .....	10,000.00
June 30, 1906 (sundry civil act) .....	150,000.00
March 4, 1907 (sundry civil act) .....	60,000.00
	<hr/> Total .....
	1,736,867.63

Under the tentative plan of improvement adopted March 2, 1907, the following appropriation has been made:

By act of Congress of—	
March 2, 1907 (river and harbor act) .....	\$300,000.00
Amounts received from proceeds of sales of Government property:	
November 12, 1902 .....	75.00
October 21, 1904 .....	10.00
November 6, 1906 .....	474.10
June 24, 1907 .....	113.15
	<hr/> Total .....
	300,672.25
	<hr/> Grand total .....
	8,085,570.30

## COMMERCIAL STATISTICS.

Cotton statistics of the port of Savannah, Ga., for the commercial year ending August 31, 1906, are as follows:

*Receipts from all sources.*

Grade.	Quantity.	Weight.	Value.
	<i>Bales.</i>	<i>Pounds.</i>	
Upland .....	1,457,142	740,606,993	\$78,908,240
Sea Island .....	63,715	25,422,285	4,868,906
Total .....	1,520,857	766,029,278	83,762,146

Destination.	Upland.	Sea Island.
	<i>Bales.</i>	<i>Bales.</i>
Coastwise .....	517,894	48,415
Great Britain .....	188,914	12,948
France .....	68,941	5,381
Other continental ports .....	689,701	870
Local consumption .....	1,887	
Reshipped to interior .....	2,524	2,264
Total .....	1,468,861	64,868

*Total exports.*

Grade.	Foreign exports.	Coastwise exports.	Total.
	<i>Bales.</i>	<i>Bales.</i>	<i>Bales.</i>
Upland .....	961,467	517,894	1,468,861
Sea Island .....	21,453	43,415	64,868
Total .....	972,920	560,809	1,533,729

*Total cotton receipts and exports at Savannah, season of 1905-6.*

Receipts ----- bales-- 1,520,857  
 Exports ----- do----- 1,533,729

*Total receipts and exports of naval stores at the port of Savannah, season of 1906-7.*

## Spirits of turpentine:

Receipts ----- casks-- 194,702  
 Exports ----- do----- 189,885

## Rosin:

Receipts ----- barrels-- 665,102  
 Exports ----- do----- 666,003

*Total exports of lumber from Savannah for season of 1905-6.*

Superficial feet----- 245,868,409



*Arrivals and clearances of vessels and commerce at Savannah, Ga., from January 1 to December 31, 1906.*

[Does not include coastwise sailing vessels which are not required to enter and clear at the custom-house.]

	Arrived.			Cleared.		
	Number.	Tonnage.	Crew.	Number.	Tonnage.	Crew.
Coastwise .....	674	1,451,413	27,350	573	1,233,825	23,769
Foreign ports:						
American vessels .....	2	891	16	4	2,045	37
Foreign vessels .....	102	202,196	2,590	202	423,751	5,765
Total .....	778	1,654,500	29,962	779	1,669,441	29,571

Greatest draft:	<i>Ft. in.</i>
Arrived .....	26 3
Cleared .....	26 1

*Commerce (foreign).*

Value of exports .....	\$59,610,181.00
Value of imports .....	2,174,902.00
Duties collected .....	81,619.11

## O 2.

## IMPROVEMENT OF SAVANNAH RIVER, GEORGIA, BELOW AUGUSTA.

## OPERATIONS DURING THE FISCAL YEAR ENDING JUNE 30, 1907.

An emergency contract was entered into on July 3, 1906, with Albert J. Twiggs, of Augusta, Ga., for dike work at Tweedy's bar. Under the terms of the contract, work was to be begun within ten days from the date thereof; the contractor commenced the work of getting out materials on July 5, but owing to continued high water, actual work of construction was not begun until December 5, 1906. On August 24, 1906, the date originally set for the completion of the contract was waived. The contract was completed December 10, 1906. Under it there was built a training wall 200 feet in length on the Georgia side of the river, in which 38 cubic yards of stone, 330 cubic yards of brush fascines, and 60 piles were placed.

On November 21, 1906, an allotment of \$2,000 was made from the emergency appropriation, act of March 3, 1905, for additional dike work to restore the channel at Tweedy's bar. Under this allotment a contract was entered into on February 2, 1907, with Albert J. Twiggs, of Augusta, Ga. The contract was approved February 9, 1907, and work was begun February 20, 1907, and completed March 20, 1907. Under this contract 400 lineal feet was added to the dike on the Georgia side of the river, constructed under the contract of July 3, 1906, above mentioned, and 60 lineal feet of the old dike on the South Carolina side of the river removed, this portion of the dike having become an obstruction in the new channel which was forming at this bar. Under this contract there were placed in the work 140 piles, 815 cubic yards of brush fascines, and 132 cubic yards of stone.

While the work done during the fiscal year at Tweedy's bar has been of much benefit, the channel is still in bad condition and hard to navigate. To overcome this, the jetty constructed during the fiscal year should be extended and a damaged jetty just below it should be repaired.

Of the amount expended during the fiscal year, viz., \$3,932.04, the sum of \$2,642.13 was for dike work under contracts of July 3, 1906, and February 2, 1907, with Albert J. Twiggs; \$717.25 for repairing and fitting out the snag boat *Tugaloo*, preparatory to beginning snagging operations early in the coming fiscal year, and \$572.66 for office expenses and contingencies.

The last appropriation under the estimate of 1890 was made by act of June 28, 1902. In 1903 the district officer reported that the project was still uncompleted and submitted an additional estimate of \$75,000 as being necessary to carry the work to completion in addition to the annual cost of maintenance. Since this estimate was submitted, an allotment of \$5,000 has been made from the emergency act of April 28, 1904, and an allotment of \$2,000 from the emergency act of March 3, 1905, and the sum of \$43,000 appropriated by river and harbor acts of March 3, 1905, and March 2, 1907, but owing to provision for maintenance work a further sum of \$46,000, in addition to annual cost of maintenance, will be required to carry the project to completion.

#### COMMERCE AND NAVIGATION.

A detailed statement of the sources of the commerce of this river is given on page 1331 of the Annual Report of the Chief of Engineers for 1890 and on page 1504 of the report for 1897.

During the calendar year 1906 there were 4 steamers engaged in river traffic between Savannah and Augusta, which carried a total of 53,500 tons of freight, valued at \$5,350,000. There were also transported to Savannah from points on the river 1,300 tons of rice, valued at \$60,000. The total commerce for the year amounted to 54,800 tons, valued at \$5,410,000.

During the same year 16,911,500 feet B. M. of timber was rafted down the river, valued at \$186,148.

#### *Money statement.*

July 1, 1906, balance unexpended.....	\$1,316.16
Amount allotted from emergency appropriation, act approved March 3, 1905 .....	2,000.00
Amount appropriated by river and harbor act approved March 2, 1907.....	30,000.00
	<hr/>
June 30, 1907, amount expended during fiscal year, for maintenance of improvement .....	33,316.16
	3,932.04
	<hr/>
July 1, 1907, balance unexpended.....	29,384.12
July 1, 1907, outstanding liabilities.....	1,906.06
	<hr/>
July 1, 1907, balance available.....	27,478.06
	<hr/>
Amount that can be profitably expended in fiscal year ending June 30, 1909, in addition to the balance unexpended July 1, 1907:	
For works of improvement.....	\$25,000.00
For maintenance of improvement.....	4,000.00
	<hr/>
	29,000.00
Submitted in compliance with requirements of sundry civil act of June 4, 1897, and of section 7 of the river and harbor act of 1899.	

## AMOUNT AND DATE OF ALL APPROPRIATIONS.

Under the original project for improvement of the Savannah River, adopted in 1880, the following appropriations were made:

By act of Congress of—	
March 3, 1881.....	\$15,000.00
August 2, 1882.....	25,000.00
July 5, 1884.....	15,000.00
August 5, 1886.....	15,000.00
August 11, 1888.....	21,000.00
	<hr/>
	91,000.00
Unexpended balance from last appropriation, carried to new project.....	19.91
	<hr/>
Total.....	90,980.09
Received from other appropriations for use of snag boat.....	2,500.00
	<hr/>
Total.....	93,480.09

Since the existing project for improving the Savannah River was adopted the following appropriations have been made for this work:

By act of Congress of—	
August 11, 1888 (balance unexpended).....	\$19.91
September 19, 1890.....	25,000.00
July 13, 1892.....	35,000.00
August 18, 1894.....	15,000.00
June 3, 1896.....	15,000.00
March 3, 1899.....	20,000.00
June 6, 1900.....	64,000.00
March 3, 1901.....	100,000.00
June 28, 1902.....	86,000.00
November 11, 1904 (allotted from emergency appropriation).....	5,000.00
March 3, 1905.....	13,000.00
November 24, 1906 (allotted from emergency appropriation).....	2,000.00
March 2, 1907 (river and harbor act).....	30,000.00
	<hr/>
Total.....	410,019.91
Amount received from "Proceeds of sale of Government property" November 12, 1902.....	50.00
Amount received from "Proceeds of sale of Government property" October 21, 1904.....	15.00
Amount received from "Proceeds of sale of Government property" February 17, 1905.....	590.77
	<hr/>
Total.....	410,675.68
	<hr/>
Grand total.....	504,155.77

## CONTRACTS IN FORCE.

Name and address of contractor: Albert J. Twiggs, Augusta, Ga.

Character and amount of work: Dike work; 66 piles, 350 cubic yards brush bundles, and 40 cubic yards of stone.

Rate (in place): Stone, \$4 per cubic yard; brush, \$1 per cubic yard; piles furnished and driven, \$5 each.

Date of approval: (Emergency—no approval required).

Work begun: July 5, 1906.

Expires: September 5, 1906 (waived; no specific date fixed).

Completed: December 10, 1906.

# 1282 REPORT OF THE CHIEF OF ENGINEERS, U. S. ARMY.

Name and address of contractor: Albert J. Twiggs, Augusta, Ga.

Character and amount of work: Dike work; 175 piling; 1,000 cubic yards brush bundles; 140 cubic yards stone; and removal of 75 linear feet of old dike; board and lodging for inspectors.

Rate (in place): Piling, \$3.50 each; brush, \$1 per cubic yard; stone, \$3.25 per cubic yard; removal old dike, \$2 per linear foot; board and lodging for inspector, \$20 per month.

Date of approval: February 9, 1907.

Work begun: February 20, 1907.

Expires: Thirty working days after date of notification of approval.

Completed: March 20, 1907.

## O 3.

### IMPROVEMENT OF SAVANNAH RIVER ABOVE AUGUSTA, GEORGIA.

#### OPERATIONS DURING THE FISCAL YEAR ENDING JUNE 30, 1907.

No work was done.

#### COMMERCE AND NAVIGATION.

A detailed statement of the commerce tributary to this river is given in a report on the examination and survey of the river, printed as House Executive Document No. 213, Fifty-first Congress, first session.

The freight carried on the river consists of cotton, grain, fertilizers, and general merchandise. In 1906 it amounted to 1,416 tons, valued at \$185,000.

#### *Money statement.*

Amount appropriated by river and harbor act approved March 2, 1907.	\$3, 000. 00
July 1, 1907 balance unexpended	3, 000. 00
Amount (estimated) required for completion of existing project	8, 000. 00

{	Amount that can be profitably expended in fiscal year ending June 30, 1909, for works of improvement, in addition to the balance unexpended July 1, 1907	3, 000. 00
	Submitted in compliance with requirements of sundry civil act of June 4, 1897.	

#### AMOUNT AND DATE OF ALL APPROPRIATIONS.

Under the original project of improvement of Savannah River above Augusta, adopted in 1879, the following appropriations were made:

By act of Congress of—

June 14, 1880	\$16, 000
March 3, 1881	8, 000
August 2, 1882	15, 000
Total	39, 000

Since the existing project for improving this portion of Savannah River was adopted the following appropriations have been made for this work:

By act of Congress of—	
July 13, 1892.....	\$10, 000
August 18, 1894.....	6, 000
June 3, 1896.....	3, 000
March 3, 1899.....	1, 000
March 3, 1905.....	2, 000
March 2, 1907.....	3, 000
Total .....	25, 000
Grand total .....	64, 000

#### O 4.

#### IMPROVEMENT OF HARBOR AT DARIEN AND DOBOY BAR, GEORGIA.

Darien Harbor is constituted by that portion of Darien River between the town of Darien and Doboy Sound. Doboy bar constitutes the nearest ocean entrance to Darien Harbor and the Altamaha River. These two works were consolidated by the act of Congress approved June 13, 1902.

#### OPERATIONS DURING THE FISCAL YEAR ENDING JUNE 30, 1907.

Darien Harbor: No work was done. The \$4,339.08, given in the money statement as expended during the fiscal year, was in part payment of cost of repairs to the U. S. dredge *Savannah* upon her completion of dredging on Doboy bar May 31, 1906, including office expenses and contingencies.

Doboy bar: No work was done. The \$1,000.10, given in the money statement as expended during the fiscal year, was in part payment of cost of repairs to the U. S. dredge *Savannah* upon her completion of dredging on Doboy bar May 31, 1906, including office expenses and contingencies.

#### COMMERCE AND NAVIGATION.

The commerce of Darien consists almost entirely of timber. A daily steamer runs to Brunswick. The bulk of the timber passing through Darien Harbor from the Altamaha River will probably cross Doboy bar when the improvement is complete.

In 1906 the commerce of Darien Harbor amounted to 130,991 tons, valued at \$1,231,566, an increase over the previous year of 48,783 tons and of \$508,459 in valuation.

Besides the above, there were rafted through Darien Harbor to Brunswick and Savannah, 29,683,000 feet of timber, valued at \$445,235.

*Money statements.*

## DARIEN HARBOR.

July 1, 1906, balance unexpended.....	\$4,338.39
Amount received from refundment.....	.69
	<hr/>
	4,339.08
June 30, 1907, amount expended during fiscal year, for work of improvement.....	4,339.08
	<hr/>
{ Amount that can be profitably expended in fiscal year ending June 30, 1909, for maintenance of improvement, in addition to the balance unexpended July 1, 1907.....	10,000.00
{ Submitted in compliance with requirements of sundry civil act of June 4, 1897, and of section 7 of the river and harbor act of 1899.	

## DOBOY BAR.

July 1, 1906, balance unexpended.....	\$1,000.00
Amount received from refundment.....	.10
	<hr/>
	1,000.10
June 30, 1907, amount expended during fiscal year, for works of improvement.....	1,000.10

## AMOUNT AND DATE OF ALL APPROPRIATIONS.

Previous to the existing project there was appropriated for Darien Harbor:

By act of Congress, June 18, 1878..... \$8,000.00

Since the existing project for improving this work was adopted the following appropriations have been made:

September 19, 1890.....	\$25,000.00
July 13, 1892.....	25,000.00
August 18, 1894.....	25,000.00
June 3, 1896.....	20,000.00
March 3, 1899.....	10,000.00
From the appropriation of \$30,000, Darien Harbor and Doboy bar, June 13, 1902, there was allotted, November 7, 1902.....	24,000.00
Amount allotted November 23, 1904.....	26,865.96
	<hr/>
Total.....	155,865.96
Amount received from appropriation for Cumberland Sound, Georgia and Florida.....	1,500.00
Amount received from refundment, July 31, 1906.....	.69

Total..... 157,366.65

Grand total..... 165,366.65

Previous to the existing project there was appropriated for Doboy bar:

By act of Congress, August 5, 1886..... \$5,795.40

Since the existing project for this work was adopted the following appropriation was made:

March 3, 1899.....	\$70,000.00
Unexpended balance carried to consolidated appropriation for improving harbor at Darien and Doboy bar.....	50,865.96
Total.....	19,134.04
Amount allotted December 23, 1903.....	2,000.00
Amount allotted November 23, 1904.....	28,000.00
Amount received from refundment.....	.10
Total.....	49,134.14
Grand total.....	54,929.54
Aggregate of appropriations for Darien Harbor and Doboy bar.....	220,296.19

#### COMMERCIAL STATISTICS.

*Arrivals and clearances of vessels at Darien, Ga., from January 1 to December 31, 1906.*

	Arrived.			Cleared.		
	Number.	Tonnage.	Crew.	Number.	Tonnage.	Crew.
Coastwise.....	42	37,863	645	20	8,950	147
Foreign ports:						
American vessels.....				2	1,201	14
Foreign vessels.....	21	25,753	418	40	52,224	714
Total.....	63	63,616	1,063	62	62,375	876

*Timber shipments from port of Darien, Ga., from January 1 to December 31, 1906.*

	Superficial feet.	Value.
Foreign.....	54,459,467	\$968,466
Coastwise.....	5,870,921	120,700
Total.....	60,330,388	1,089,166

#### Commerce.

Value of exports and imports (coastwise and foreign).....	\$1,231,666.00
Total collections.....	1,779.14

#### O 5.

#### IMPROVEMENT OF ALTAMAHA, OCONEE, AND OCMULGEE RIVERS, GEORGIA.

##### (A) ALTAMAHA RIVER.

OPERATIONS DURING THE FISCAL YEAR ENDING JUNE 30, 1907.

One hundred and sixty-eight snags, 3 stumps, and a sunken flat were removed from the channel, 103 overhanging trees were re-

\* Exclusive of timber rafted through the port to Brunswick and Savannah, valued at \$445,235.

moved from the banks, and 59 trees on the banks were girdled. The cut-off at Beards Bluff was enlarged by dynamiting the banks, and 25 old piles were removed from one end of the cut. Surveys were made of the shoals at Oglethorpe Bluff and Beards Bluff.

A training dike, to be 635 feet in length, was begun at Oglethorpe Bluff for the purpose of removing the sand shoal at that place. There were placed in the work 201 piling, 138 cubic yards of brush facines, and 20 cubic yards of stone. One hundred and eighty-five cubic yards of rock were quarried and transported 20 miles to the site of the work. Work on the dike was in progress at the close of the fiscal year.

Forty-eight piles in an old dike at Oglethorpe Bluff, which had become an obstruction to navigation, were removed.

All of the above work was done by hired labor, with the use of Government plant, and was confined to that portion of the river between Doctortown and the Forks.

Of the amount expended during the fiscal year, viz, \$2,722.66, the sum of \$985.13 was for snagging, \$1,692.98 for constructing a training dike and removal of portions of two old dikes, and \$44.55 for surveys and contingencies.

#### COMMERCE AND NAVIGATION.

The principal items of commerce of the river are timber and naval stores and general merchandise.

During the calendar year 1906, 83,800,000 feet B. M. of timber were rafted down the river, valued at about \$1,185,000. The majority of this timber came from the Oconee and Ocmulgee rivers, and was rafted down the Altamaha to mills at Darien and vicinity. About 36,000,000 feet, valued at about \$398,000, originated on the Altamaha.

There were also handled about 14,000 tons of freight, valued at about \$449,000.

#### *Money statement.*

July 1, 1906, balance unexpended.....	\$5, 437. 31
Amount received from proceeds of sale of Government property.....	111. 50
Amount allotted from river and harbor act approved March 2, 1907.....	17, 000. 00
	<hr/>
	22, 548. 81
June 30, 1907, amount expended during fiscal year:	
For works of improvement.....	\$1, 737. 53
For maintenance of improvement.....	985. 13
	<hr/>
	2, 722. 66
July 1, 1907, balance unexpended.....	19, 826. 15
July 1, 1907, outstanding liabilities.....	2, 762. 80
	<hr/>
July 1, 1907, balance available.....	17, 063. 35
	<hr/>
Amount (estimated) required for completion of existing project.....	99, 000. 00
	<hr/>
{ Amount that can be profitably expended in fiscal year ending June 30, 1909, in addition to the balance unexpended July 1, 1907:	
For works of improvement.....	\$25, 000. 00
For maintenance of improvement.....	4, 000. 00
	<hr/>
	29, 000. 00
{ Submitted in compliance with requirements of sundry civil act of June 4, 1897, and of section 7 of the river and harbor act of 1899.	



## AMOUNT AND DATE OF ALL APPROPRIATIONS.

Under the original project of improvement of the Altamaha River, adopted in 1880, the following appropriations were made:

By act of Congress of—	
March 3, 1881.....	\$5,000.00
August 2, 1882.....	15,000.00
July 5, 1884.....	20,000.00
August 5, 1886.....	20,000.00
August 11, 1888.....	10,000.00
	<hr/> 70,000.00
Unexpended balance of last appropriation carried to new project.....	223.41
Total.....	<hr/> <hr/> 69,776.59

Since the existing project for improving Altamaha River was adopted, in 1890, the following appropriations have been made for this work:

By act of Congress of—	
August 11, 1888 (unexpended balance).....	223.41
September 19, 1890.....	15,000.00
July 13, 1892.....	15,000.00
August 18, 1894.....	10,000.00
June 3, 1896.....	10,000.00
March 3, 1899.....	6,000.00
June 6, 1900 (allotted from emergency appropriation).....	9,000.00
June 13, 1902.....	10,000.00
March 3, 1905.....	10,000.00
March 2, 1907 (amount allotted from appropriation for Altamaha, Oconee, and Ocmulgee rivers).....	17,000.00
Total.....	<hr/> 102,223.41
November 30, 1906 (received from sale of Government property).....	111.50
Grand total.....	<hr/> <hr/> 172,111.50

## (B) OCONEE RIVER.

## OPERATIONS DURING THE FISCAL YEAR ENDING JUNE 30, 1907.

*Below Milledgeville.*—Six hundred and fifty-four snags, 66 stumps, and 4 cubic yards of rock were removed from the channel, 531 overhanging trees and 61 logs were removed from the banks, and 44 trees on the banks were girdled. This work was done between the Forks and Dublin.

At Fish Trap shoal, 6 miles below Dublin, the training dike constructed the year previous was raised and extended 130 feet.

During June the combined hoister and pile driver *Sapelo* was hauled out on marine railway for the purpose of making some slight repairs to her hull, and the overhauling of the machinery was also begun. A new Lidgewood hoisting engine and a new Hayward bucket were purchased for this boat. The machinery of the snag boat *Oconee* was overhauled and repaired during April.

*Above Milledgeville.*—Between the Georgia Railroad bridge (54 miles above Milledgeville) and the northern boundary of Greene

County work was carried on between September 5, 1906, and October 20, 1906, when the available balance from the allotment of \$3,000 from the appropriation for Oconee River made by the river and harbor act of March 3, 1905, was exhausted. Between the dates mentioned 125 snags, 11 stumps, and 17 cubic yards of rock were removed from the channel and 127 overhanging trees were cut on the banks. Five spur dams, each 50 feet in length, were constructed at places where the river needed contracting. This work, together with that done the previous fiscal year, has rendered this stretch of river readily navigable at or above the ordinary summer stage.

Of the total amount expended during the fiscal year, viz, \$3,980.04, the sum of \$369.24 was for rock removal, \$1,157.69 for snagging, \$427.48 for dike work, \$344.66 for repairs to snag boat *Oconee*, \$1,579.54 for clearing the river of obstructions between the Georgia Railroad bridge (above Milledgeville) and the northern boundary of Greene County, and \$101.43 for contingencies.

#### COMMERCE AND NAVIGATION.

During the year 1906 the steamers plying the river between the Forks and the Central of Georgia Railway bridge, 25 miles above Dublin, handled 49,000 tons of freight, valued at about \$500,000. The commerce carried on the river between the Georgia Railroad bridge, above Milledgeville, and the northern boundary of Greene County during the same period amounted to 1,246 tons, valued at about \$40,000. In addition to this there were rafted down the river during the same year 42,455,437 feet B. M. of timber, valued at about \$546,800. Excepting the timber traffic, the commerce of the river is carried on in detached sections tributary to the railroads crossing the river.

#### *Money statement.*

July 1, 1906, balance unexpended.....	\$4, 032. 35
Amount received from refundment.....	. 50
Amount allotted from river and harbor act approved March 2, 1907....	29, 000. 00
	<hr/> 33, 032. 85
June 30, 1907, amount expended during fiscal year:	
For works of improvement.....	\$2, 438. 68
For maintenance of improvement.....	1, 541. 36
	<hr/> 3, 980. 04
July 1, 1907, balance unexpended.....	29, 052. 81
July 1, 1907, outstanding liabilities.....	1, 280. 00
	<hr/> 27, 772. 81
July 1, 1907, balance available.....	<hr/> 27, 772. 81
Amount (estimated) required for completion of existing project....	94, 842. 00
	<hr/> <hr/>
Amount that can be profitably expended in fiscal year ending June 30, 1909, in addition to the balance unexpended July 1, 1907:	
For works of improvement.....	\$25, 000. 00
For maintenance of improvement.....	4, 000. 00
	<hr/> 29, 000. 00
Submitted in compliance with requirements of sundry civil act of June 4, 1897, and of section 7 of the river and harbor act of 1899.	

## AMOUNT AND DATE OF ALL APPROPRIATIONS.

Since the works of improvement were begun the following appropriations have been made:

By act of Congress of—	
June 18, 1878.....	\$10,000.00
March 3, 1879.....	1,500.00
June 14, 1880.....	1,500.00
March 3, 1881.....	2,500.00
August 2, 1882.....	5,000.00
July 5, 1884.....	3,000.00
August 5, 1886.....	9,000.00
August 11, 1888.....	12,500.00
Total.....	45,000.00
Unexpended balance from last appropriation carried to new project.....	177.82
Total.....	44,822.18

Since the existing project for improving the Oconee River was adopted the following appropriations have been made for this work:

By act of Congress of—	
August 11, 1888 (unexpended balance).....	\$177.82
September 19, 1890.....	25,000.00
July 13, 1892.....	25,000.00
August 18, 1894.....	10,000.00
June 3, 1896.....	10,000.00
March 3, 1899.....	10,000.00
June 6, 1900 (allotted from emergency appropriation).....	3,750.00
June 13, 1902.....	25,000.00
March 3, 1905.....	15,000.00
March 2, 1907 (allotted from appropriation for Altamaha, Oconee and Ocmulgee rivers).....	29,000.00
	152,927.82
Amounts received from proceeds of sale of Government property:	
October 26, 1903.....	43.00
October 21, 1904.....	15.00
February 17, 1905.....	590.77
Amount received by refundment:	
July 31, 1906.....	.50
Total.....	153,577.09
Grand total.....	198,399.27

## (C) OCMULGEE RIVER.

## OPERATIONS DURING THE FISCAL YEAR ENDING JUNE 30, 1907.

Five hundred and forty-eight snags and 39 stumps were removed from the channel, 1,506 overhanging trees and 12 logs were removed from the banks, and 113 trees on the banks were girdled. Two sand bars were improved by harrowing and 90 cubic yards of earth removed by dynamite from a point of bank which projected into the channel at Tanyard shoals.

A training wall and spur dam just below Macon were raised by the placing therein of 1,373 cubic yards of brush fascines and 40

cubic yards of brickbats. The stone already in the dikes was removed, as far as practicable, and replaced on top of the brush.

A new spur dam, 245 feet in length, was built at a point 4 miles below Macon, in which 543 cubic yards of brush fascines and 124 cubic yards of stone were placed.

Of the total amount expended during the fiscal year, viz, \$8,480.06, the sum of \$4,258.40 was for snagging, harrowing two sand bars, and blasting off a projecting point of bank; \$3,420.45 for construction and repair of dikes below Macon, and \$801.21 for surveys and contingencies.

The final appropriation under the estimate of 1890 was made by act of June 28, 1902. In 1903 the district officer reported that the project was still uncompleted, and submitted an additional estimate of \$75,000, exclusive of annual cost of maintenance, as being necessary to complete the improvement. Since that estimate was submitted there has been appropriated \$44,000, but owing to provision for maintenance work, a further sum of \$51,000, in addition to annual cost of maintenance, will be required to complete the project.

#### COMMERCE AND NAVIGATION.

A detailed discussion of this subject will be found on pages 1478 to 1484 of the Report of the Chief of Engineers for 1890, and page 1520 of the same Report for 1897.

For several years past there has been no navigation at all between Macon and Hawkinsville, except that one small steamer made occasional trips to Macon. A company has been formed at Macon for the purpose of operating a line of steamers between that point and Brunswick, and have two steamers now under construction for this purpose.

During the calendar year 1906 the steamers plying the river handled 18,000 tons of freight, valued at about \$550,000.

There were also rafted down the river 35,500,000 feet B. M. of timber, valued at about \$567,000.

#### *Money statement.*

July 1, 1906, balance unexpended.....	\$9, 051. 35
Amount received from refundment.....	. 45
Amount allotted from river and harbor act approved March 2, 1897.....	29, 000. 00
	<hr/> 38, 051. 80 -
June 30, 1907, amount expended during fiscal year:	
For works of improvement.....	\$3, 480. 06
For maintenance of improvement.....	5, 000. 00
	<hr/> 8, 480. 06
July 1, 1907, balance unexpended.....	29, 571. 74
July 1, 1907, outstanding liabilities.....	1, 100. 00
	<hr/> 28, 471. 74
Amount that can be profitably expended in fiscal year ending June 30, 1909, in addition to the balance unexpended July 1, 1907:	
For works of improvement.....	\$25, 000. 00
For maintenance of improvement.....	5, 000. 00
	<hr/> 30, 000. 00
Submitted in compliance with requirements of sundry civil act of June 4, 1897, and of section 7 of the river and harbor act of 1899.	

## AMOUNT AND DATE OF ALL APPROPRIATIONS.

Under the original project of improvement of the Ocmulgee River, adopted in 1876, the following appropriations were made:

## By act of Congress of—

August 14, 1876.....	\$15,000.00
June 18, 1878.....	15,000.00
March 3, 1879.....	7,000.00
June 14, 1880.....	7,000.00
March 3, 1881.....	5,000.00
August 2, 1882.....	5,000.00
July 5, 1884.....	3,000.00
August 5, 1886.....	7,500.00
August 11, 1888.....	15,000.00

Total.....	79,500.00
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Unexpended balance carried forward from last appropriation to new project.....	109.27
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Total.....	79,390.73
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Since the existing project for improving Ocmulgee River was adopted the following appropriations have been made for the work:

## By act of Congress of—

August 11, 1888 (unexpended balance).....	\$109.27
September 19, 1890.....	30,000.00
July 13, 1892.....	25,000.00
August 18, 1894.....	10,000.00
June 3, 1896.....	10,000.00
March 3, 1899.....	20,000.00
June 6, 1900.....	40,000.00
March 3, 1901.....	40,000.00
June 28, 1902.....	50,000.00
March 3, 1905.....	15,000.00
March 2, 1907 (allotted from appropriation for Altamaha, Oconee, and Ocmulgee rivers).....	29,000.00

Total.....	275,109.27
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## Amounts received from "Proceeds of Sale of Government Property:"

November 12, 1902.....	106.00
October 28, 1903.....	43.00
February 17, 1905.....	590.76

## Amounts received by refundments:

Reclaimed by Captain Gillette.....	20.00
July 31, 1906.....	.45

Total.....	275,869.48
------------	------------

Grand total.....	355,260.21
------------------	------------

## O 6.

## IMPROVEMENT OF CLUB AND PLANTATION CREEKS, GEORGIA.

## OPERATIONS DURING THE FISCAL YEAR ENDING JUNE 30, 1907.

No work was done during the fiscal year. It became evident that a portion of the route to be excavated crossed a marsh, not ordinarily covered with water, that belonged to private parties, and no provision had been made for a right of way for the improvement. An effort is

now being made to secure such a right without cost to the United States, and there is a fair prospect that this result will be accomplished. In the meantime no work will be undertaken, since the channel would not be usable without the marsh cut, and no further appropriation is recommended at this time.

*Money statement.*

Amount appropriated by river and harbor act approved March 2, 1907... \$20,000  
 Amount (estimated) required for completion of existing project..... 20,700

APPROPRIATION.

March 2, 1907..... \$20,000

O 7.

IMPROVEMENT OF BRUNSWICK HARBOR, GEORGIA.

OPERATIONS DURING THE FISCAL YEAR ENDING JUNE 30, 1907.

Surveys were made of the channels in East River, Turtle River, and Academy Creek, and of the dredged channel across the outer bar.

The combined boathouse and storehouse, erected about three years ago, having become unserviceable because of advance of shore line, was torn down and material purchased for the building of a more suitable one on property leased from the Atlanta, Birmingham and Atlantic Railway Company.

The suboffice at Brunswick was maintained and minor repairs were made to survey launches.

Specifications covering the execution of all dredging provided for under the new project adopted by act of Congress approved March 2, 1907, were prepared and submitted.

The amount expended during the fiscal year, \$2,250.40, was for surveys, contingencies, and care of plant.

COMMERCE AND NAVIGATION.

Information in regard to the commerce of Brunswick before the improvement will be found on page 1523 of the Report of the Chief of Engineers for 1897.

The chief articles of export are cotton, lumber, cross-ties, and naval stores, of which the shipments for the calendar year 1906 were as follows: Of cotton, 158,245 bales; of lumber and cross-ties, 399,308,000 feet, and of naval stores, 40,692 barrels of turpentine and 198,224 barrels of rosin.

The regular lines of steamships established between this port and New York and Boston comprise a total of 14 steamers. During the year 1906 they made 116 round trips and carried 207,225 tons of freight.

On the inland waters there are a number of small steamers plying between Brunswick and adjacent ports, besides numerous schooners, small sailboats, and tugs and gasoline launches towing barges. It

is estimated that for the year 1906 this portion of the commerce amounted to 120,000 tons, valued at about \$3,500,000.

The total amount of freight received and shipped at the port during 1906 was 1,423,985 tons, valued at \$35,892,335.

During November, 1906, the Bee Line of steamships, to ply between Brunswick and New York, and Brunswick and Habana, Cuba, was inaugurated, and two round trips were made between Brunswick and New York during the calendar year. At the close of the fiscal year this line had five steamships in service and had awarded contracts for the construction of three additional ones. This line is operated in connection with the Atlanta, Birmingham and Atlantic Railway Company, which company is now constructing extensive terminals at Brunswick for the purpose.

*Money statement.*

July 1, 1906, balance unexpended.....	\$14,371.00
Amount received from refundment.....	.15
Amount appropriated by river and harbor act approved March 2, 1907.....	146,650.00
	<hr/>
	161,021.15
June 30, 1907, amount expended during fiscal year, for maintenance of improvement.....	2,250.40
	<hr/>
July 1, 1907, balance unexpended.....	158,770.75
July 1, 1907, outstanding liabilities.....	1,504.85
	<hr/>
July 1, 1907, balance available.....	157,265.90
	<hr/>
Amount (estimated) required for completion of existing project.....	350,000.00
	<hr/>
{ Amount that can be profitably expended in fiscal year ending June 30, 1909, for works of improvement, in addition to the balance unexpended July 1, 1907.....	350,000.00
{ Submitted in compliance with requirements of sundry civil act of June 4, 1897.....	

AMOUNT AND DATE OF ALL APPROPRIATIONS.

Since the work of improvement was begun the following appropriations have been made:

By act of Congress of—	
July 4, 1836.....	\$10,000.00
March 3, 1879.....	20,000.00
June 14, 1880.....	10,000.00
March 3, 1881.....	5,000.00
August 2, 1882.....	25,000.00
July 5, 1884.....	10,000.00
August 5, 1886.....	22,500.00
August 11, 1888.....	35,000.00
September 19, 1890.....	35,000.00
July 13, 1892.....	27,500.00
	<hr/>
Total.....	200,000.00
For maintenance:	
August 18, 1894.....	10,000.00
June 3, 1896.....	15,000.00
March 3, 1899.....	10,000.00
	<hr/>
Total.....	235,000.00
Unexpended balance of last appropriation carried to new project....	182.75

234,817.25

# 1294 REPORT OF THE CHIEF OF ENGINEERS, U. S. ARMY.

Under the project adopted by act of Congress approved June 13, 1902, the following appropriations have been made:

By act of Congress of—

March 3, 1899 (unexpended balance from last appropriation) .....	\$182. 75
June 13, 1902:	
Outer bar.....	\$40, 000
Inner harbor.....	120, 000
Academy Creek.....	5, 000
	165, 000. 00
March 3, 1905.....	40, 000. 00
July 31, 1906 (amount received by refundment) .....	. 15
Total .....	205, 182. 90
Unexpended balance of last appropriation carried to new project .....	12, 120. 75
	<u>193, 062. 15</u>

Under the project providing for channels 30 feet in depth at mean high water, the following appropriations have been made:

By act of Congress of—

March 3, 1905 (unexpended balance from last appropriation) .....	12, 120. 75
March 2, 1907.....	146, 650. 00
Total .....	158, 770. 75
Grand total.....	<u>586, 650. 15</u>

## COMMERCIAL STATISTICS.

### *Commerce (coastwise and foreign), 1906.*

Value of exports:

Coastwise .....	\$8, 677, 362. 00
Foreign .....	10, 184, 906. 00
Value of imports.....	16, 920, 073. 00
Total collections .....	2, 064. 73

### *Statement of receipts of naval stores, 1906.*

Rosin .....	barrels.....	204, 420
Spirits .....	do.....	55, 690

### *Arrivals and clearances of vessels and commerce at Brunswick, Ga., 1906.*

	Arrived.			Cleared.		
	Number.	Tonnage.	Crew.	Number.	Tonnage.	Crew.
Coastwise .....	487	584, 753	9, 869	461	535, 850	8, 555
Foreign ports:						
American vessels.....	18	12, 711	173	13	10, 093	119
Foreign vessels.....	56	60, 677	985	85	94, 088	1, 476
Total.....	561	654, 141	11, 027	559	640, 031	10, 150



## O 8.

IMPROVEMENT OF INSIDE WATER ROUTE BETWEEN SAVANNAH,  
GEORGIA, AND FERNANDINA, FLORIDA.

## OPERATIONS DURING THE FISCAL YEAR ENDING JUNE 30, 1907.

Dredging, under contract of March 31, 1906, with P. Sanford Ross (Incorporated), which was begun May 1, 1906, was continued until October 26, 1906, when the contract was completed. There were removed during the fiscal year from The Dividings 5,292.7 cubic yards, and from Mud River 83,437.1 cubic yards, a total of 88,729.8 cubic yards. The total quantity of material removed under the contract was 170,905.2 cubic yards.

There was constructed in Jekyl Creek, about 1 mile south of the north entrance to the creek a training wall 2,000 feet in length. This wall was constructed of a brush mattress, 15 feet in width, held in place by a ridge of oyster shells. The average height of the crest of the wall is 4 feet above mean low water. There were placed in the work 1,400 cubic yards of brush and 32,115 bushels of oyster shells.

A survey was made of the dredged channel in Mud River in November, 1906, and temporary ranges marking the axis of the channel were placed. Examinations were made in June, 1907, of the channels at The Dividings, Little Mud River, Jekyl Creek, and Mud River.

A new hull for the survey launch *Cosine* was about 70 per cent completed.

Of the total amount expended during the fiscal year, viz, \$30,319.76, the sum of \$3,613.79 was for construction of training wall in Jekyl Creek, \$22,793.07 for dredging under contract with P. Sanford Ross (Incorporated), at 15.2 cents per cubic yard, including final payment, and \$3,912.90 for surveys, office expenses, and contingencies.

The original estimate for the improvement of this route was completed with the appropriation of \$41,000 made by the river and harbor act of March 3, 1905, but the improvement was still uncompleted. The reasons for this are set forth in a report of the district officer, with estimate of cost of the work remaining to be done, printed on page 1208 of the Annual Report of the Chief of Engineers for 1906. It is now estimated that \$36,000, in addition to \$10,000 annually for maintenance, will be required to complete the work.

## COMMERCE AND NAVIGATION.

A detailed discussion of the commerce over this route will be found in the Report of the Chief of Engineers for 1901, page 1653.

The commerce over this route, especially the upper end, is carried on, to a large extent, by small schooners. On the lower end of the route there are several small steamboats making regular trips between Brunswick, Darien, Fernandina, and St. Simons and Cumberland islands and the Satilla River, besides a number of tugs which tow lighters carrying naval stores, lumber, and cross-ties. During the calendar year 1906 there was carried over the route 151,835 tons of freight, valued at about \$3,870,160. These figures show an increase

in commerce practically double that reported for the calendar year 1905. This is due to the fact that full and complete figures for 1906 were obtained, which it had not been practicable to do for many years past, so that, while it is a fact that the commerce over this route is steadily increasing, the yearly gain is nothing like as great as would appear.

In addition to the above there were rafted or towed in rafts over this route during the same period 97,010,000 feet B. M. of timber, valued at about \$1,268,000.

Little, if any, of this commerce went over the entire route.

*Money statement.*

July 1, 1906, balance unexpended.....	\$30,798.69
Amount appropriated by river and harbor act approved March 2, 1907.....	30,000.00
	<hr/> 60,798.69
June 30, 1907, amount expended during fiscal year:	
For works of improvement.....	\$4,215.77
For maintenance of improvement.....	26,103.99
	<hr/> 30,319.76
July 1, 1907, balance unexpended.....	30,478.93
July 1, 1907, outstanding liabilities.....	144.00
	<hr/> 30,334.93
July 1, 1907, balance available.....	<hr/> <hr/> 30,334.93
Amount that can be profitably expended in fiscal year ending June 30, 1909, in addition to the balance unexpended July 1, 1907:	
For works of improvement.....	\$36,000.00
For maintenance of improvement.....	5,000.00
	<hr/> 41,000.00
Submitted in compliance with requirements of sundry civil act of June 4, 1897, and of section 7 of the river and harbor act of 1899.	

AMOUNT AND DATE OF ALL APPROPRIATIONS.

Previous to the existing project there were appropriated as follows:

Parsons Cut or Romerly Marshes, Georgia:

Act of Congress approved—	
August 2, 1882.....	\$10,000.00
July 5, 1884.....	10,000.00
August 5, 1886.....	17,475.00
August 11, 1888.....	4,633.77
	<hr/> 42,108.77
Total by United States.....	42,108.77
From Georgia and Florida Steamboat Company.....	5,000.00
	<hr/> 47,108.77
Total.....	<hr/> <hr/> 47,108.77

Jekyl Creek, Georgia:

Act of Congress approved—	
August 11, 1888.....	5,000.00
September 19, 1890.....	7,500.00
July 13, 1892.....	7,500.00
August 18, 1894.....	4,000.00
	<hr/> 24,000.00
Total.....	<hr/> <hr/> 24,000.00

Since the existing project for improving this route was adopted six appropriations, aggregating \$135,000, have been made, as follows:

Inside route:

Act of Congress approved—

July 13, 1892.....	\$15,000.00
August 18, 1894.....	20,000.00
June 3, 1896.....	14,000.00
June 13, 1902.....	15,000.00
March 3, 1905.....	41,000.00
March 2, 1907.....	30,000.00
Total.....	135,000.00
Grand total.....	206,108.77

CONTRACT IN FORCE.

Name and address of contractor.	Character of work.	Amount.	Rate per cubic yard.	Date of approval.	Work begun.	Expires.
P. Sanford Ross (Incorporated), Jersey City, N. J. <sup>a</sup>	Dredging...	Cu. yds. 172,000	15.2	1906. Apr. 16	1906. May 1	Feb. 28, 1907

<sup>a</sup>Completed Oct. 26, 1906.

O 9.

IMPROVEMENT OF SKIDAWAY NARROWS, GEORGIA.

OPERATIONS DURING THE FISCAL YEAR ENDING JUNE 30, 1907.

Dredging under contract of August 11, 1905, with Wayne Cunningham, which was begun October 23, 1905, was continued until July 15, 1906, when the contract was completed. During the fiscal year there were dredged 8,046 cubic yards of material, and 50 logs and 25 stumps encountered in dredging were removed. The total quantity of material removed under the contract was 113,526 cubic yards and 53 logs and 25 stumps.

A complete survey of the Narrows was made in April and May, 1907, and specifications for the dredging necessary to complete the project were prepared and submitted.

Of the total amount expended during the fiscal year, viz, \$5,617.84, the sum of \$4,826.48 was for dredging under contract with Wayne Cunningham, at 14.5 cents per cubic yard (including final payment), and \$791.36 for surveys and contingencies.

COMMERCE AND NAVIGATION.

Owing to the improvement being incomplete, the route by way of Skidaway Narrows is not available for navigation except at high water. Even under these conditions, however, nearly all of the traffic takes this route in preference to that via Parsons Cut, and a

good deal of timber, in rafts, is being brought to Savannah by this route. As the improvement, when completed, will be available at low tide for vessels drawing over 6 feet, and will shorten the distance between Savannah and points south on the inside waterway, it is believed that it will cause a large increase of business.

*Money statement.*

July 1, 1906, balance unexpended.....	\$5,050. 69
Amount appropriated by river and harbor act approved March 2, 1907.....	35,000. 00
	<hr/> 40,050. 69
June 30, 1907, amount expended during fiscal year, for works of improvement.....	5,617. 84
	<hr/> 34,432. 85
July 1, 1907, balance unexpended.....	

APPROPRIATIONS.

March 3, 1905.....	\$20,000
March 2, 1907.....	35,000
	<hr/>
• Total.....	55,000

CONTRACT IN FORCE.

Name and address of contractor: Wayne Cunningham, Savannah, Ga.  
 Character and amount of work: Dredging 110,000 cubic yards.  
 Rate: 14.5 cents per cubic yard, place measurement.  
 Date of approval: August 21, 1905.  
 Work begun: October 23, 1905.  
 Expires: April 22, 1906 (extended; no specific date fixed).  
 Completed: July 15, 1906.

O 10.

IMPROVEMENT OF CUMBERLAND SOUND, GEORGIA AND FLORIDA.

OPERATIONS DURING THE FISCAL YEAR ENDING JUNE 30, 1907.

The dredging of a canal with the U. S. hoister *Sapelo* begun May, 1906, for the purpose of changing the course of Beach Creek, Cumberland Island, was completed July 11, 1906, by the removal of 1,300 cubic yards, making the total amount dredged 6,500 cubic yards. The dredging of this canal has removed all danger of the dike on Cumberland Island (built for the protection of the inner end of the north jetty), being undermined by the creek impinging against the inside of the structure.

A section, 250 feet in length, of the dike on Cumberland Island, where settlement had occurred, was raised to the proper level by the placing of 75 cubic yards of stone and 700 cubic yards of brush fascines. A small spur dam, consisting of 200 cubic yards of brush

fascines and 35 cubic yards of stone, was built across a deep slough, near the old breach through the beach, to stop the flow of water through the same, and also to act as a sand catcher.

A complete survey of the entrance to Cumberland Sound was made in April and May, 1907, and examinations made of the ship channel between the jetties. Floating plant was cared for and the old engineer office at Old Fernandina, and the property stored therein, was looked after by a watchman.

On June 30, 1907, the ship channel alongside the north jetty had a general depth of 24 feet at mean low water. The controlling depth was 23.5 feet at mean low water on a small lump in the channel. By reason of the encroachment of Pelican shoal and the Middle Ground shoal the channel had become somewhat crooked and rather difficult of navigation by deep-draft vessels.

The channel on the south side of the entrance has continued to deepen and enlarge and on June 30 had a controlling depth of 20 feet at mean low water, and only a small area within a width of 500 feet had a depth less than 24 feet at mean low water.

The shoal between the jetties has continued to move seaward, advancing 500 feet during the past fiscal year. Since 1903 this shoal has advanced seaward 2,500 feet, and on June 30 only a very small area had a depth less than 12 feet at mean low water, whereas in 1903 quite an extensive area had less than 6 feet at mean low water.

The shoal to the north of the north jetty has continued to enlarge, and a considerable portion of the sand which piles up back of the jetty passes through it and causes the enlargement of Pelican Shoal between the jetties.

The north jetty is low in a number of places and should be raised to bring it up to the level of high tide. Near the shore end, mainly between the high and low water limits, a large quantity of sand is carried through the jetty to the channel side by reason of the numerous voids and openings in the jetty occasioned by the use of large stone in its construction. These voids and openings should be closed. The south jetty is also very low in places and should be raised to the proper level. As the ship channel passes very close to the end of the north jetty it is desirable that it should be marked by a mound which should show plainly above high water and be visible at a considerable distance. The funds now available are to be applied toward the accomplishment of these results.

With the above exceptions, both jetties were in good condition at the close of the fiscal year.

The dike on Cumberland Island, built to protect the shore end of the north jetty, was in good condition. Sanding up has taken place on the sea side of the dike to such extent that the beach is now 500 feet wide opposite the old breach, which at one time threatened to cause the north jetty to be flanked.

Of the total amount expended during the fiscal year, viz, \$6,654.37, the sum of \$976.40 was for dredging of canal by the United States hoister *Sapelo*; \$677.68 for repairs to dike on Cumberland Island and the construction of a short spur dike in connection therewith, and \$5,000 for surveys, contingencies, and office expenses.

For commerce and navigation, see report on Fernandina Harbor, Appendix O 11.

*Money statement.*

July 1, 1906, balance unexpended.....	\$48,846.60
Amount received from refundment.....	.33
Amount received from proceeds of sale of Government property.....	8.90
Amount appropriated by river and harbor act approved March 2, 1907.....	75,000.00
	<hr/>
	123,855.83
June 30, 1907, amount expended during fiscal year, for maintenance of improvement.....	6,654.37
	<hr/>
July 1, 1907, balance unexpended.....	117,201.46
July 1, 1907, outstanding liabilities.....	1,204.23
	<hr/>
July 1, 1907, balance available.....	115,997.23
	<hr/>
{ Amount that can be profitably expended in fiscal year ending June 30, 1909, for maintenance of improvement, in addition to the balance unexpended July 1, 1907.....	
Submitted in compliance with requirements of sundry civil act of June 4, 1897, and of section 7 of the river and harbor act of 1899.	
	50,000.00

## AMOUNT AND DATE OF ALL APPROPRIATIONS.

Under the original project for improving Cumberland Sound the following appropriations were made for the work:

By act of Congress of—	
June 14, 1880.....	\$30,000
March 3, 1881.....	100,000
August 2, 1882.....	50,000
July 5, 1884.....	75,000
August 5, 1886.....	112,500
August 11, 1888.....	112,500
	<hr/>
Total.....	480,000

Under the revised project of improvement the following appropriations were made:

By act of Congress of—	
September 19, 1890.....	\$112,500
July 13, 1892.....	170,000
August 17, 1894.....	170,000
	<hr/>
Total.....	452,500

Under the existing project of improvement the following appropriations have been made:

By act of Congress of—	
June 3, 1896.....	\$5,000.00
June 4, 1897.....	350,000.00
July 19, 1897.....	50,000.00
July 1, 1898.....	450,000.00
March 3, 1899.....	400,000.00
March 3, 1901.....	200,000.00
June 28, 1902.....	400,000.00
March 3, 1903.....	400,000.00
April 28, 1904.....	55,000.00
March 3, 1905, river and harbor act.....	30,000.00
March 3, 1905, sundry civil act.....	40,000.00
March 2, 1907.....	75,000.00
	<hr/>
Total.....	2,455,000.00

## Refundments:

June 22, 1904, by Maj. J. C. Sanford.....	\$265. 45
March 30, 1904, by Maj. J. C. Sanford.....	3, 676. 35
July 31, 1906, by Colonel Quinn.....	. 33
	<u>\$3, 942. 13</u>
June 29, 1907, proceeds of sales of Government property.....	8. 90
Total.....	<u>2, 458, 951. 03</u>
Grand total .....	<u>3, 391, 451. 03</u>

## O II.

## IMPROVEMENT OF FERNANDINA HARBOR, FLORIDA.

## OPERATIONS DURING THE FISCAL YEAR ENDING JUNE 30, 1907.

Proposals were called for, under date of June 1, 1907, for all dredging provided for under the project of improvement adopted by the act of Congress approved March 2, 1907. Bids will be opened on July 1, and if a favorable price is secured work under the project will be begun early in the next fiscal year.

## COMMERCE AND NAVIGATION.

Neglecting the commerce of St. Marys, Ga., the total commerce of the harbor of Fernandina during the calendar year 1906 amounted to 955,478 tons, with a value of about \$14,496,135. The chief articles of export are lumber, phosphate rock, and naval stores, of which the shipments for the year 1906 were as follows: Lumber, 134,619,000 superficial feet; phosphate rock, 159,900 tons; rosin, 487,380 barrels, and turpentine, 5,787,421 gallons. The details of this commerce are given in the tables appended hereto.

*Money statement.*

Amount appropriated by river and harbor act approved March 2, 1907 .....	\$115, 000. 00
July 1, 1907, balance unexpended.....	115, 000. 00
July 1, 1907, outstanding liabilities.....	858. 00
July 1, 1907, balance available.....	<u>114, 142. 00</u>

## APPROPRIATION.

March 2, 1907.....	\$115, 000
--------------------	------------

## COMMERCIAL STATISTICS.

*Arrivals and clearances of vessels and commerce at Fernandina, Fla., 1906.*

	Arrived.			Cleared.		
	Number.	Tonnage.	Crew.	Number.	Tonnage.	Crew.
Coastwise .....	208	219,660	2,321	184	143,754	1,582
Foreign ports:						
American vessels .....	16	11,191	130	5	3,150	49
Foreign vessels .....	69	125,219	1,622	112	212,064	2,827
Total .....	293	356,070	4,073	301	358,988	4,458

*Commerce.*

Value of exports:	
Foreign .....	\$8,223,295.00
Coastwise .....	3,782,892.00
Value of imports:	
Foreign .....	93,748.00
Coastwise .....	906,935.00
Total commerce (including local) .....	14,496,135.00
Duties collected .....	8,776.16

## O 12.

## REMOVING SUNKEN VESSELS OR CRAFT OBSTRUCTING OR ENDANGERING NAVIGATION.

## OPERATIONS DURING THE FISCAL YEAR ENDING JUNE 30, 1907.

On April 13, 1907, the sum of \$6,000 was allotted for removing the wreck of the three-masted schooner *Arthur C. Wade*, 699 tons burden, sunk in Savannah Harbor, near quarantine, on the northern edge of the new dredged channel at that point. The work of removal was begun April 17, 1907, and completed May 27, 1907, the work being done by hired labor with the use of the U. S. snag boat *Tugaloo*. The wreck was broken up with dynamite, and the pieces picked up by the snag boat and deposited behind training walls or dikes in such a way that they can not become obstructions in the future.

The following property was recovered from the wreck, viz:

- 2 anchors, weight about 5,000 pounds.
- 1,000 feet of 1½-inch chain.
- 6 rudder straps.
- 1 steering gear.
- 1 old awning.
- 2 ship bits.
- 10 blocks (unserviceable).
- 50 feet wire cable.
- 1 closet (broken).
- 1 compass (unserviceable).
- 1 boat davit.
- 1 fog horn.
- 1 ship's log.
- 1 hawse pipe, in two pieces.



All the above articles, except the chain, were sold at public auction, after due notice by circulars and posters, for the net sum of \$232.10, which was deposited to the credit of the appropriation. A satisfactory price not being offered for the chain it was withdrawn and special report made to the Chief of Engineers as to its disposition.

The snag boat *Tugaloo* suffered some injury in consequence of the hard usage incident to the removal of the wreck, rendering repairs necessary, the cost of which would seem to be properly chargeable to the allotment. Authority to make this charge has not yet been received and, as all of the salvage has not yet been sold, a complete financial statement can not be prepared, but the cost of removal will be well within the allotment.

During the fiscal year \$2,883.49 was expended, leaving a balance on hand of \$3,116.51.



## APPENDIX P.

### IMPROVEMENT OF CERTAIN RIVERS AND HARBORS IN FLORIDA.

REPORT OF MAJ. FRANCIS R. SHUNK, CORPS OF ENGINEERS, OFFICER  
IN CHARGE, FOR THE FISCAL YEAR ENDING JUNE 30, 1907.

#### IMPROVEMENTS.

- |   |  |
|---|--|
| 1. St. Johns River, Florida.                                    | 10. Orange River, Charlotte Harbor, and Caloosahatchee River, Florida. |
| 2. St. Johns River, Florida, opposite the city of Jacksonville. | 11. Sarasota Bay, Florida.   |
| 3. St. Johns River at Orange Mills flats, Florida.              | 12. Manatee River, Florida.  |
| 4. Volusia bar, Florida.  | 13. Tampa Bay, Florida.  |
| 5. Oklawaha River, Florida.                                     | 14. Hillsboro Bay, Florida.  |
| 6. Indian River, Florida.                                       | 15. Crystal, Anclote, and Suwanee rivers, Florida.                     |
| 7. Biscayne Bay, Florida.                                       | 16. Withlacoochee River, Florida.                                      |
| 8. Harbor at Key West, Florida, and entrance thereto.           | 17. Removing the water hyacinth from Florida waters.                   |
| 9. Kissimmee River, Florida.                                    |  |

UNITED STATES ENGINEER OFFICE,  
*Jacksonville, Fla., July 8, 1907.*

GENERAL: I have the honor to submit herewith annual report upon river and harbor works in this district for the fiscal year ended June 30, 1907.

Very respectfully, your obedient servant,

FRANCIS R. SHUNK,  
*Major, Corps of Engineers.*

Brig. Gen. A. MACKENZIE,  
*Chief of Engineers, U. S. A.*

#### P I.

#### IMPROVEMENT OF ST. JOHNS RIVER, FLORIDA.

The work done during the past year has consisted of dredging, rock removal, and a small amount of jetty work. The dredging was done both by contract and by hired labor, using the Government dredges *St. Johns* and *Jacksonville*. The contract work has been carried on under the continuing contract system.

Dredging under contract with the North American Dredging Company for dredging in Dames Point Cut, entered into May 17, 1906, began August 24, 1906, and was completed April 5, 1907. Eight hundred and seventy-seven thousand five hundred and twenty-five and three-tenths cubic yards were removed. At the contract price, 9.9 cents per cubic yard, the cost was \$86,875. Including incidentals, the total cost to the United States was \$93,164.06, or 10.6 cents per cubic yard. As a result the channel at Dames Point was finished.

On July 3, 1906, contract was entered into with R. G. Ross for the removal of about 15,500 cubic yards of rock, at \$4.33 per cubic yard, and about 75,000 cubic yards of other material, at 22.75 cents per cubic yard. Work under this contract began July 24, 1906, and was still in progress June 30, 1907. On that date a total of 7,420.53 cubic yards of rock and 69,688.7 cubic yards of other material had been removed. At the contract price, the cost was \$47,985.07. Including incidentals, the cost was \$53,502.06, or \$4.83 per cubic yard for rock and 25.37 cents per cubic yard for other material. As a result the lower portion of Trout Creek shoal was 50 per cent completed.

On January 3, 1907, an allotment of \$10,000 was made from the emergency appropriation made by act of March 3, 1905, and \$2,339.02 from the emergency appropriation made by act of June 13, 1902, for building up the shore end of the north jetty at the entrance where erosion had occurred. Contract was entered into with R. G. Ross for this work March 2, 1907. Work began April 5, and was completed June 7, 1907. Two thousand four hundred and ten and seventy-four one-hundredths cubic yards of stone were placed in the jetty from near the shore end seaward, a distance of 2,120 feet. This portion of the crest of the jetty was built to a height of 12 feet above mean low water at the shore end and 8 feet above mean low water along the middle and outer portions. At the contract price, \$4.90 per cubic yard, the cost was \$11,812.63. Including incidentals, the total cost to the United States was \$12,339.02, or \$5.01 per cubic yard.

The dredge *Jacksonville*, having been laid up for lack of funds December 16, 1905, resumed work September 14, 1906. This dredge worked on Trout Creek, Brills, Dunns Creek, Drummond, Mayport, and Arlington shoals during the year. Much shifting of the dredge was required. The depth of dredging was slight and much of the material encountered was very refractory. The amount removed during the fiscal year was 535,078.2 cubic yards. The total cost to the United States was \$100,914.61, or 18.86 cents per cubic yard, including extraordinary repairs, the cost of new machinery, alterations and additions, and the proportionate cost of office, superintendence, surveys, and other expenses. The cost, taking expenses while working only, was 9.66 cents per cubic yard.

As a result, the upper portion of Trout Creek shoal and the cuts at Brills, Dunns Creek, and Drummond shoals were completed, Mayport Cut was 90 per cent completed and Arlington Cut was 60 per cent completed.

The dredge *St. Johns* was put in commission August 1, 1906, and, after being overhauled and repaired at League Island Navy-Yard, resumed work at Wards Bank Cut October 20, 1906, where the dredge continued at work until the end of the fiscal year. During the fiscal year 476,371.8 cubic yards were removed by this dredge and carried to sea, an average distance of 3.6 miles. The total cost to the United States was \$67,233.73, or 14.11 cents per cubic yard, including expenses while the dredge was laid up and its proportion of office, superintendence and other expenses. The cost, taking expenses while working only, was \$33,146.58, or 6.95 cents per cubic yard.

As a result the channel at Wards Bank was completed to a depth of 25 feet. The projected width of 300 feet was nearly, but not quite, attained throughout.

For further information, see current summary, page 328.

*Money statement.*

July 1, 1906, balance unexpended.....	\$322, 292. 83
Amount appropriated by river and harbor act approved March 2, 1907.....	100, 000. 00
Amount allotted from appropriation for emergencies in river and harbor acts of June 13, 1902, and March 3, 1905.....	12, 339. 02
Refundment of overpayment.....	2. 00
Receipts from sales.....	767. 85
Amount received for damage to Government property.....	450. 00
	<hr/> 435, 851. 70

June 30, 1907, amount expended during fiscal year:	
For works of improvement.....	\$251, 441. 09
For maintenance of improvement.....	71, 413. 48
	<hr/> 322, 854. 57

July 1, 1907, balance unexpended.....	112, 997. 13
July 1, 1907, outstanding liabilities.....	36, 745. 16

July 1, 1907, balance available.....	<hr/> 76, 251. 97
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July 1, 1907, amount covered by uncompleted contracts.....	<hr/> 35, 326. 43
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{ Amount that can be profitably expended in fiscal year ending June 30, 1909, for maintenance of improvement, in addition to the balance unexpended July 1, 1907.....	150, 000. 00
{ Submitted in compliance with requirements of sundry civil act of June 4, 1897, and of section 7 of the river and harbor act of 1899.	

## APPROPRIATIONS FOR IMPROVEMENT OF ST. JOHNS RIVER, FLORIDA.

Under the original project the following appropriations were made for the work:

June 14, 1880.....	\$125, 000	September 19, 1890.....	\$170, 000
March 3, 1881.....	100, 000	July 13, 1892.....	112, 500
August 2, 1882.....	150, 000	March 3, 1893.....	284, 500
July 5, 1884.....	150, 000		
August 5, 1886.....	150, 000	Total.....	1, 417, 000
August 11, 1888.....	175, 000		

Under the existing project of improvement appropriations have been made:

June 3, 1896.....	\$200, 000. 00
March 3, 1899.....	200, 000. 00
June 13, 1902.....	<sup>a</sup> 350, 000. 00
March 3, 1903.....	350, 000. 00
April 28, 1904.....	395, 000. 00
March 3, 1905 (sundry civil act).....	205, 000. 00
March 3, 1905.....	<sup>b</sup> 100, 000. 00
June 6, 1900 (allotment from emergency appropriation).....	10, 000. 00
Sale of old material.....	445. 96
June 30, 1906 (sundry civil act).....	309, 750. 00
March 2, 1907.....	100, 000. 00
June 6 1900 (allotment from emergency appropriation).....	10, 000. 00
June 13, 1902 } (allotment from emergency appropriation).....	12, 339. 02
March 3, 1905 }	
Unexpended balance, allotment for river and harbor board.....	89. 16
Receipts from sales.....	2, 120. 13
Refundments of overpayments.....	31. 83
Receipts for damage to Government property.....	450. 00
Total .....	<hr/> 3, 651, 780. 14

<sup>a</sup> And continuing contract for \$950,000.  
<sup>b</sup> And continuing contract for \$309,750.

## CONTRACTS IN FORCE.

Contractors: North American Dredging Company.

Work: Dredging.

Date: May 17, 1906.

Approved: June 18, 1906.

Date of beginning: July 20, 1906.

Date of completion: January 20, 1907. (Extended. Completed April 5, 1907.)

Quantities: About 910,000 cubic yards of sand, etc., at 9.9 cents.

Contractor: Roderick G. Ross.

Work: Furnishing and depositing stone at shore end of north jetty.

Date: March 2, 1907.

Approved: March 15, 1907.

Date of beginning: April 18, 1907.

Date of completion: June 18, 1907.

Quantities: 2,410 cubic yards.

Contractor: Roderick G. Ross.

Work: Dredging and rock removal.

Date: July 3, 1906.

Approved: July 20, 1906.

Date of beginning: August 23, 1906.

Date of completion: December 23, 1906. (Extended for reasonable period.)

Quantities: 75,000 cubic yards soft material and 15,500 cubic yards rock.

## COMMERCIAL STATISTICS.

*Commerce of St. Johns River, Florida, during the year ending December 31, 1906.*

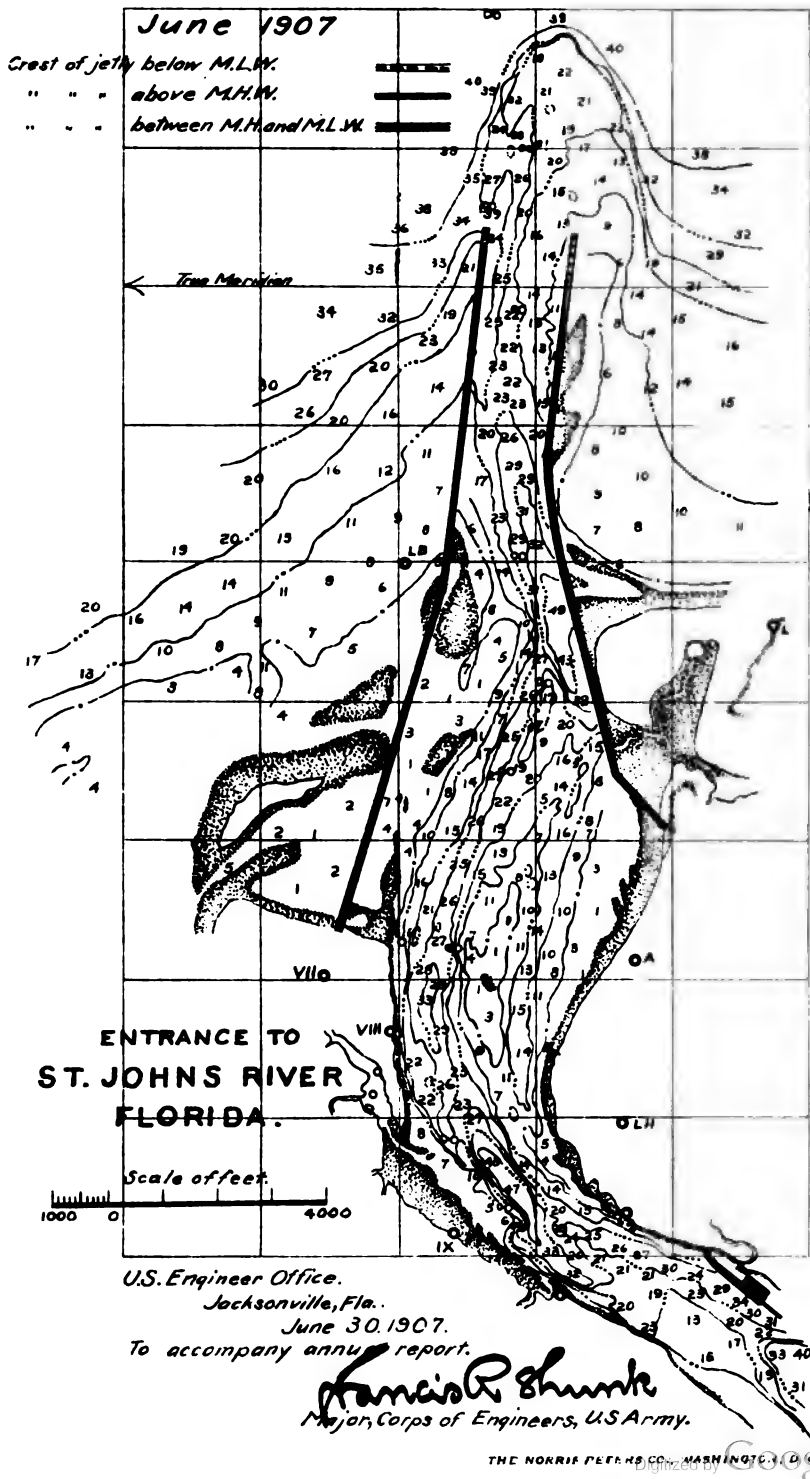
[Furnished by the Jacksonville Board of Trade.]

Articles.	Gross tonnage.	Articles.	Gross tonnage.
Ammonia.....	1, 175	Kaolin.....	26, 131
Bacon.....	9, 998	Live stock.....	1, 875
Coal.....	182, 207	Lumber, pine.....	472, 701
Canned goods.....	1, 138	Lumber, cypress.....	22, 552
Cement.....	10, 770	Merchandise, general.....	384, 044
Cotton-seed oil.....	10, 472	Naval stores.....	87, 638
Cotton.....	1, 431	Oil.....	13, 094
Crowsties.....	744, 989	Oranges.....	114, 000
Cocconuts.....	290	Potatoes.....	1, 476
Doors, sash, and blinds.....	246	Sugar.....	9, 529
Flour.....	6, 320	Shoes.....	1, 154
Fertilizers.....	289, 255	Salt.....	5, 615
Fish and oysters.....	1, 800	Steel rails.....	31, 620
Fruits and vegetables.....	41, 601	Shingles.....	6, 172
Grain.....	1, 757	Tobacco.....	470
Gravel.....	350	Wire.....	887
Hay.....	24, 535	Wines and liquors.....	5, 000
Hides.....	1, 530		
Iron pipe.....	1, 279	Total.....	2, 455, 101

*Arrivals and departures of vessels for the year ending December 31, 1906.*

## COASTWISE.

Kind of vessel.	Arrivals.		Departures.	
	No.	Tons.	No.	Tons.
Steamers.....	316	882, 289	325	862, 007
Sailing vessels.....	313		272	







## FOREIGN.

Kind of vessel.	Arrivals.		Departures.	
	No.	Tons.	No.	Tons.
Steamers.....	14	20,690	16	21,472
Sailing vessels.....	29		89	

Estimated percentage of total trade of neighborhood carried by water, 40.

Probable increase of trade were the improvement completed, 100 per cent.

Probable effect of project on freight rates: Would reduce freight rates 12 to 15 per cent.

Transportation business established during 1906: None.

Transportation business abandoned during 1906: None.

## P 2.

## IMPROVEMENT OF ST. JOHNS RIVER, FLORIDA, OPPOSITE THE CITY OF JACKSONVILLE.

The work was advertised June 12, 1907, bids to be opened July 24, 1907.

*Money statement.*

Amount appropriated by river and harbor act approved March 2, 1907.....	\$371,500.00
July 1, 1907, balance unexpended.....	371,500.00

## APPROPRIATION.

March 2, 1907.....	\$371,500
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## P 3.

## IMPROVEMENT OF ST. JOHNS RIVER, FLORIDA, AT ORANGE MILLS FLATS.

No work was done during the fiscal year ending June 30, 1907. The amount expended was for contingencies.

Project for expenditure of available funds was approved April 5, 1907.

See Report of Chief of Engineers for 1898, pages 1344-1348; for 1901, page 1738; for 1904, pages 1690-1691; for 1906, page 1218.

*Money statement.*

July 1, 1906, balance unexpended.....	\$1,365.74
Amount appropriated by river and harbor act approved March 2, 1907.....	25,000.00
	26,365.74
June 30, 1907, amount expended during fiscal year, for works of improvement.....	135.00
July 1, 1907, balance unexpended.....	26,230.74
Amount (estimated) required for completion of existing project.....	65,000.00

{ Amount that can be profitably expended in fiscal year ending June 30, 1909, for works of improvement, in addition to the balance unexpended July 1, 1907..... 65,000.00  
 Submitted in compliance with requirements of sundry civil act of June 4, 1897.

## APPROPRIATIONS.

March 3, 1899.....	\$40,000
June 13, 1902.....	30,000
March 3, 1905.....	25,000
March 2, 1907.....	25,000
Total.....	120,000

## COMMERCIAL STATISTICS.

*Commerce of Orange Mills Flats, Fla., during the year ending December 31, 1906.*

Articles.	Gross tonnage.	Articles.	Gross tonnage.
Bacon.....	5	Livestock.....	550
Brick.....	13,500	Lumber.....	377,317
Cement.....	175	Merchandise, general.....	43,389
Coal.....	3,300	Naval stores.....	23,938
Cross-ties.....	11,430	Oil and gasoline.....	272
Dressed meat.....	1	Oranges.....	5,019
Eggs.....	8	Roots, herbs, etc.....	30,000
Fertilizers.....	280	Railroad supplies.....	516
Fish and oysters.....	345	Sash, doors, and blinds.....	9,292
Fruits.....	102	Shingles.....	14,508
Grain.....	13,773	Tobacco.....	150
Hay.....	2,655	Vegetables.....	1,802
Hides.....	11	Total.....	559,893
Kaolin.....	3,000		

## P 4.

## IMPROVEMENT OF VOLUSIA BAR, FLORIDA.

The river and harbor act of March 2, 1907, appropriated \$2,000 for maintenance of this improvement. Shoaling having recently occurred, due to the unusually low stage of water, this amount was found to be insufficient to afford the necessary relief to commerce. Recommendation was therefore made that an additional amount of \$5,000 be allotted for the work, from the appropriation for emergencies in rivers and harbors. The recommendation was approved and this sum was allotted June 3, 1907, from the emergency appropriation of March 3, 1905.

The U. S. dredge and snag boat *Florida* began operations on Lake Monroe bar May 20. At the end of the fiscal year a total quantity of 23,854.2 cubic yards of sand had been dredged and five snags and three overhanging trees had been removed. The total cost to the United States was \$3,119.34.

Result of the expenditure is a channel through Lake Monroe bar 100 feet wide, 1,475 feet long, and 7 feet deep at mean low water, and channels 60 feet wide and 7 feet deep through the following shoals: Fort Florida shoal, 500 feet long; North Manuels Bend, 950 feet long; Barkers Reach, 450 feet long; Coxetters Bend, 665 feet long.

Further information is contained in current summary, page 330.

*Money statement.*

Amount appropriated by river and harbor act approved March 2, 1907	\$2,000.00
Amount allotted from appropriation for emergencies in river and harbor act of March 3, 1905	5,000.00
	7,000.00
June 30, 1907, amount expended during fiscal year, for works of improvement	1,489.97
July 1, 1907, balance unexpended	5,510.03
July 1, 1907, outstanding liabilities	1,629.37
July 1, 1907, balance available	3,880.66
Amount that can be profitably expended in fiscal year ending June 30, 1909, for maintenance of improvement, in addition to the balance unexpended July 1, 1907	
Submitted in compliance with requirements of sundry civil act of June 4, 1897, and of section 7 of the river and harbor act of 1890.	5,000.00

## APPROPRIATIONS.

June 14, 1880	\$5,000	March 3, 1899	\$2,000
March 3, 1881	5,500	June 13, 1902	2,000
August 2, 1882	5,000	April 28, 1904	2,000
July 5, 1884	2,000	March 3, 1905	2,000
August 5, 1886	7,500	March 2, 1907	2,000
August 11, 1888	500	March 3, 1905 (allotment from emergency appropriation)	5,000
September 19, 1890	500		
July 13, 1892	1,000	Total	44,000
August 18, 1894	1,000		
June 3, 1896	1,000		

## COMMERCIAL STATISTICS.

*Commerce of Volusia bar, Florida, during the year ending December 31, 1906.*

Articles.	Gross tonnage.	Articles.	Gross tonnage.
Bacon	86	Merchandise, general	218,800
Canned goods	138	Naval stores	33,042
Cement	297	Oil and gasoline	1,046
Coal	28,017	Oranges	10,193
Cross-ties	4,200	Peaches	500
Fertilizers	8,575	Railroad supplies	11,345
Fish and oysters	1,640	Sash, doors, and blinds	124
Flour	160	Shingles	512
Fruits	400	Shoes	95
Grain	7,720	Sirup, honey, etc	17
Hay	2,990	Tobacco	14
Hides	40	Vegetables	13,750
Live stock	500		
Lumber	68,500	Total	412,701

## P 5.

## IMPROVEMENT OF OKLAWAHA RIVER, FLORIDA.

No work was done during the fiscal year ending June 30, 1907. The expenditures were for repairs to the U. S. dredge *Florida*.

Project for the expenditure of available funds was approved March 22, 1907.

For further information, see Report of Chief of Engineers for 1896, pages 1314-1316; for 1905, page 1298.

*Money statement.*

Amount appropriated by river and harbor act approved March 2, 1907-	\$15,000. 00
June 30, 1907, amount expended during fiscal year, for works of improvement-----	1,931. 06
July 1, 1907, balance unexpended-----	13,068. 34
Amount (estimated) required for completion of existing project----	1,000. 00
Amount that can be profitably expended in fiscal year ending June 30, 1909, in addition to the balance unexpended July 1, 1907:	
For works of improvement-----	1,000. 00
For maintenance of improvement-----	5,000. 00
	6,000. 00
Submitted in compliance with requirements of sundry civil act of June 4, 1897, and section 7 of the river and harbor act of 1899.	

## APPROPRIATIONS.

September 19, 1890-----	\$10,000	June 13, 1902-----	\$2,000
July 13, 1892-----	1,000	March 3, 1905-----	2,000
August 18, 1894-----	3,000	March 2, 1907-----	15,000
June 3, 1896-----	3,000		
March 3, 1899-----	3,000	Total-----	39,000

## COMMERCIAL STATISTICS.

*Commerce of Oklawaha River for year ending December 31, 1906.*

Articles.	Gross tonnage.
General merchandise .....	4,100
Naval stores .....	5,147
Oranges .....	26
Cotton .....	25
Total .....	9,298

## P 6.

## IMPROVEMENT OF INDIAN RIVER, FLORIDA.

*Between Goat Creek and Jupiter Inlet.*—No work was done during the fiscal year ending June 30, 1907. The amount expended was for outstanding liabilities and repairs to dredge *Florida*.

Project for expenditure of available funds was approved March 22, 1907.

For further information, see Report of Chief of Engineers for 1896, pages 1318–1320; for 1905, pages 1299–1300; for 1906, page 1220.

*Money statement.*

July 1, 1906, balance unexpended.....	\$2, 218. 38
Amount appropriated by river and harbor act approved March 2, 1907.....	9, 000. 00
	<hr/> 11, 218. 38
June 30, 1907, amount expended during fiscal year, for works of improvement.....	1, 890. 62
	<hr/> 9, 327. 76
<hr/>	
{ Amount that can be profitably expended in fiscal year ending June 30, 1909, for maintenance of improvement, in addition to the balance unexpended July 1, 1907.....	
{ Submitted in compliance with requirements of sundry civil act of June 4, 1897, and of section 7 of the river and harbor act of 1899.	
	5, 000. 00

APPROPRIATIONS.

July 13, 1892 (between Goat Creek and Jupiter Inlet).....	\$15, 000. 00
August 18, 1894 (Negro Cut).....	5, 000. 00
March 2, 1895 (Negro Cut).....	15, 000. 00
February 26, 1896 (Jupiter Inlet).....	500. 00
June 3, 1896 (Negro Cut).....	7, 500. 00
March 3, 1899 (Negro Cut).....	5, 000. 00
June 13, 1902 (between Goat Creek and Jupiter Inlet).....	2, 000. 00
March 3, 1905 (between Goat Creek and Jupiter Inlet).....	20, 000. 00
Allotment from emergency river and harbor appropriation of June 6, 1900 (for opening Jupiter Inlet).....	1, 000. 00
For rent of dredge.....	14. 62
March 2, 1907 (between Goat Creek and Jupiter Inlet).....	9, 000. 00
	<hr/> 80, 014. 62
Total.....	

P 7.

IMPROVEMENT OF BISCAYNE BAY, FLORIDA.

No work has been done by the Florida East Coast Railway Company during the fiscal year.

At the beginning of the year work of dredging and rock excavation, under the contract with P. Sanford Ross (Incorporated), was in progress. The work was continued until August 31. It was found that the dredged cut filled in almost as fast as it could be excavated, and, with the approval of the Chief of Engineers, supplemental contract was entered into with the contractor providing for suspension of work until conditions should be more favorable. The total quantities removed during the year were 92.4 cubic yards of sand, at 24 cents per cubic yard, and 2,298.8 cubic yards of rock, at \$1.78 per cubic yard. The total cost to the United States was \$5,234.62, or 31 cents per cubic yard for sand, and \$2.26 per cubic yard for rock.

No permanent result was accomplished, as the channel filled almost as fast as dredged.

For further information, see current summary, page 332, and Report of the Chief of Engineers for 1906, page 1221.

### *Money statement.*

July 1, 1906, balance unexpended.....	\$113, 708. 29
Amount appropriated by river and harbor act approved March 2, 1907 <sup>a</sup> .....	100, 000. 00
	<hr/> 213, 708. 29
Balance deposited, emergencies in river and harbor works.....	240. 83
	<hr/> 213, 465. 46
June 30, 1907, amount expended during fiscal year:	
For works of improvement.....	\$11, 174. 79
For maintenance of improvement.....	175. 00
	<hr/> 11, 349. 79
July 1, 1907, balance unexpended.....	202, 115. 67
July 1, 1907, outstanding liabilities.....	12, 579. 51
	<hr/> 189, 536. 16
July 1, 1907, amount covered by uncompleted contracts.....	80, 107. 47
Amount (estimated) required for completion of existing project.....	146, 000. 00
	<hr/> <hr/>
Amount that can be profitably expended in fiscal year ending June 30, 1909, for works of improvement, in addition to the balance unexpended July 1, 1907.....	146, 000. 00
Submitted in compliance with requirements of sundry civil act of June 4, 1897.	

### APPROPRIATIONS.

Act of June 13, 1902.....	\$50, 000. 00
Act of March 3, 1903.....	250, 000. 00
Emergency appropriation, river and harbor act of March 3, 1905.....	10, 000. 00
Overpayment prior to July 1, 1905.....	. 48
March 3, 1905, allotment from emergency appropriation <sup>b</sup> .....	10, 000. 00
March 2, 1907 <sup>c</sup> .....	100, 000. 00
	<hr/>
Total.....	410, 000. 48

### CONTRACTS IN FORCE.

Contractor: P. Sanford Ross (Incorporated).

Work: Dredging and construction of breakwater.

Date: December 17, 1903.

Approved: January 9, 1904.

Date of beginning: March 14, 1904.

Date of completion: March 14, 1906. (Work suspended by supplemental agreement.)

Quantities: Dredging—about 154,000 cubic yards of sand, rate 24 cents per cubic yard; 92,000 cubic yards of rock, rate \$1.78 per cubic yard. Construction of breakwater—about 4,500 tons of hard rock, at \$5.50 per ton; about 17,000 cubic yards of coral rock, at \$2.50 per cubic yard.

<sup>a</sup> And continuing contract for \$146,000 additional.

<sup>b</sup> Returned to Treasury, \$240.83.

<sup>c</sup> Continuing contract—authorized for \$146,000 additional.

## COMMERCIAL STATISTICS.

*Commerce of Biscayne Bay during the year ending December 31, 1906.*

[Furnished by W. W. Prout, president Board of Trade, Miami, Fla.]

Articles.	Gross tonnage.	Articles.	Gross tonnage.
Fertilizers .....	4,300	Oranges .....	120
Fish and oysters .....	1,920	Pineapples .....	2,300
Fruits .....	180	Railroad supplies .....	21,000
Grain .....	740	Tobacco .....	280
Hay .....	3,000	Sash, doors, and blinds .....	50
Hides .....	205	Vegetables .....	150
Live stock .....	230		
Lumber .....	6,000	Total .....	56,406
Merchandise, general .....	16,000		

*Arrivals and departures of vessels for the year ending December 31, 1906.*

Kind of vessel.	Arrivals.		Departures.	
	Number.	Tons.	Number.	Tons.
Steamers .....	267	390,000	267	460,000
Sailing vessels .....	270	22,560	183	12,860
Yachts .....	65		65	
Fishing vessels .....	a 193	1,920		

a In service.

Estimated number of passengers carried by water, 35,107.

Estimated percentage of total trade of neighborhood carried by water, 35.

Probable increase of trade were the improvement completed, 50 per cent.

Probable effect of the project on freight rates: Would greatly reduce them.

Transportation business established during 1906: Export lumber, bark for tannic acid, and railroad supplies.

Transportation business abandoned during 1906: None.

## P 8.

## IMPROVEMENT OF HARBOR AT KEY WEST, FLORIDA, INCLUDING ENTRANCE THERETO.

Work at Key West Harbor during the fiscal year has consisted of dredging and a survey of the northwest channel.

At the beginning of the fiscal year, work of dredging by the U. S. dredge *Key West* was in progress on the northwest bar. This work continued until August 11, when it ceased, owing to exhaustion of funds. The total quantity of material removed was 48,004.4 cubic yards. The total cost to the United States was \$6,794.41, or 14.15 cents per cubic yard.

On August 27 the *Key West* proceeded to Philadelphia, Pa., for work on the Delaware River.

The river and harbor act of March 2, 1907, appropriated \$200,000 for continuing the improvement and for maintenance, by dredging and work on jetties, or by construction of training walls, in the discretion of the Secretary of War. On April 9, 1907, the Chief of Engineers authorized the expenditure of \$2,500 for a survey between the bar and the harbor, in order to obtain information upon which to

base a project for expenditure of these funds. At the end of the year the field work of this survey was completed and work on the map was in progress.

For description, project, and work accomplished, see summary, page 334.

*Money statement.*

July 1, 1906, balance unexpended.....	\$10, 572. 77
Money value of property lost by employee.....	51. 87
Amount appropriated by river and harbor act approved March 2, 1907.....	200, 000. 00
	<hr/> 210, 624. 64
Refundment of overpayment paid prior to July 1, 1906.....	. 10
	<hr/> 210, 624. 74
By Treasury settlement No. 44497, accounts of Major Sanford.....	20. 62
	<hr/> 210, 604. 12
June 30, 1907, amount expended during fiscal year, for works of improvement .....	11, 560. 45
	<hr/>
July 1, 1907, balance unexpended.....	199, 043. 67
July 1, 1907, outstanding liabilities.....	324. 08
	<hr/>
July 1, 1907, balance available.....	198, 719. 59
	<hr/>
Amount (estimated) required for completion of existing project.....	Unknown.
	<hr/>
{ Amount that can be profitably expended in fiscal year ending June 30, 1909, for maintenance of improvement, in addition to the balance unexpended July 1, 1907.....	
{ Submitted in compliance with requirements of sundry civil act of June 4, 1897, and of section 7 of the river and harbor act of 1899.	
	50, 000. 00

APPROPRIATIONS.

August 2, 1882.....	\$25, 000. 00
August 5, 1886 (survey).....	2, 500. 00
August 11, 1888.....	25, 000. 00
September 19, 1890.....	40, 000. 00
July 13, 1892.....	75, 000. 00
August 18, 1894.....	80, 000. 00
June 3, 1896.....	80, 000. 00
March 3, 1899.....	25, 000. 00
Allotment from emergency river and harbor act June 6, 1900.....	10, 000. 00
June 13, 1902 (rivers and harbors).....	100, 000. 00
March 3, 1905.....	50, 000. 00
Received from sales.....	1. 50
Received from other sources.....	51. 97
March 2, 1907.....	200, 000. 00
	<hr/>
Total .....	712, 553. 47

P 9.

IMPROVEMENT OF KISSIMMEE RIVER, FLORIDA.

For project, description, etc., see summary, page 335.

Project for expenditure of available funds was approved April 11, 1907. It is proposed to continue the work in Kissimmee River, to



dredge shoal places in Istokpoga Creek, and to trim overhanging trees, to do the work by hired labor, using a Government dredge and snag boat.

The United States dredge and snag boat *Kissimmee* commenced operations on May 23, 1907, by repairing and extending the bulkhead at the upper end of Southport Canal, between Lake Tohopekaliga and Cypress Lake, and operations were in progress there at close of the fiscal year. During the fiscal year 600 linear feet of sheet piling bulkhead were constructed.

The money expended for new work was \$815.92 and for maintenance was \$543, which includes all engineering and contingent expenses. The cost per linear foot of bulkhead construction was \$2.26.

The volume of commerce shows an increase of 2 per cent.

No lines of transportation were established nor any abandoned.

#### *Money statement.*

July 1, 1906, balance unexpended.....	\$94. 53
Amount appropriated by river and harbor act approved March 2, 1907.....	12, 221. 00
	<hr/> 12, 315. 53
June 30, 1907, amount expended during fiscal year:	
For works of improvement.....	\$815. 92
For maintenance of improvement.....	543. 00
	<hr/> 1, 358. 92
July 1, 1907, balance unexpended.....	10, 956. 61
July 1, 1907, outstanding liabilities.....	1, 972. 87
	<hr/> 8, 983. 74
{ Amount that can be profitably expended in fiscal year ending June 30, 1909, for maintenance of improvement, in addition to the balance unexpended July 1, 1907.....	5, 000. 00
{ Submitted in compliance with requirements of sundry civil act of June 4, 1897, and of section 7 of the river and harbor act of 1899.	

#### APPROPRIATIONS.

June 13, 1902.....	\$8, 000
March 3, 1905.....	7, 000
March 2, 1907.....	12, 221
Total.....	<hr/> 27, 221

#### COMMERCIAL STATISTICS.

*Commerce of Kissimmee River, Florida, for the year ending December 31, 1906.*

[Compiled from information furnished by Capt. Clay Johnson, Kissimmee, Fla.]

Articles.	Gross tonnage.	Articles.	Gross tonnage.
Brick.....	16	Hay.....	80
Building material, miscellaneous.....	100	Hides.....	25
Cattle and sheep.....	750	Logs.....	6, 250
Crate material.....	200	Lumber.....	250
Cross-ties.....	60	Oranges and fruit.....	200
Fertilizers.....	200	Resin and turpentine.....	250
Fish.....	750	Vegetables.....	25
General merchandise.....	100		
Grain.....	375	Total.....	10, 111
Groceries.....	500		

## P 10.

IMPROVEMENT OF ORANGE RIVER, CHARLOTTE HARBOR, AND  
CALOOSAHATCHEE RIVER, FLORIDA.

These improvements were consolidated by the river and harbor act of June 13, 1902.

The river and harbor act of March 2, 1907, appropriated \$3,000 for maintenance of the improvements.

On April 24, 1907, the following allotment of funds was approved:

To Orange River.....	\$1, 000
To Caloosahatchee River.....	2, 000
Total.....	3, 000

## (A) ORANGE RIVER.

For project, description, etc., see summary, page 336. No work was done during the fiscal year and no money was expended.

Project for expenditure of available funds was approved April 26, 1907. It is proposed to remove snags and trim overhanging trees, the work to be done by a chartered boat, or by hired labor, using a Government plant, as may be expedient.

The volume of commerce at Orange River increased 202 per cent during the fiscal year. No lines of transportation were established nor any abandoned.

*Money statement.*

Amount appropriated by river and harbor act approved March 2, 1907..	\$1, 000. 00
July 1, 1907, balance unexpended.....	1, 000. 00

{ Amount that can be profitably expended in fiscal year ending June 30, 1909, for maintenance of improvement, in addition to the balance unexpended July 1, 1907.....	1, 500. 00
{ Submitted in compliance with requirements of sundry civil act of June 4, 1897, and of section 7 of the river and harbor act of 1899.	

## APPROPRIATIONS.

June 13, 1902 (allotted).....	\$2, 000
March 3, 1905 (allotted).....	1, 000
March 2, 1907 (allotted).....	1, 000
Total.....	4, 000

## COMMERCIAL STATISTICS.

*Commerce of Orange River, Florida, for the year ending December 31, 1906.*

[Compiled from information furnished by Capt. J. F. Menge, Fort Myers, Fla.]

Articles.	Gross tonnage.	Articles.	Gross tonnage.
Citrus fruits.....	1,598	General merchandise.....	1,015
Cord wood.....	3,100	Lumber.....	50
Crate material.....	100	Total.....	6,258
Fertilizer.....	400		

## (B) CHARLOTTE HARBOR AND CALOOSAHATCHEE RIVER, FROM PUNTARASA TO PUNTA GORDA, FLA.

For project, description, etc., see Annual Report, Chief of Engineers for 1903, page 282.

No work was done during the fiscal year. There being no evidence of deterioration, the recommendation that no allotment be made for maintenance of this improvement was approved on April 24, 1907.

The volume of commerce at Charlotte Harbor decreased 15 per cent. No lines of transportation were established nor any abandoned.

## APPROPRIATIONS.

## CHARLOTTE HARBOR AND PEACE CREEK, FLORIDA.

September 19, 1890.....	\$35,000
August 18, 1894.....	20,000
June 3, 1896.....	20,000
March 3, 1899.....	25,000
June 13, 1902 (allotted).....	6,000
<b>Total.....</b>	<b>106,000</b>

## COMMERCIAL STATISTICS.

*Commerce of Charlotte Harbor, Florida, for the year ending December 31, 1907.*

[Compiled from information furnished by Mr. F. K. Adams, secretary and treasurer Punta Gorda Board of Trade.]

Articles.	Gross tonnage.	Articles.	Gross tonnage.
Cattle.....	3,500	Naval stores.....	1,423
Chickens, eggs, etc.....	5	Oranges.....	1,456
Cigars.....	2	Pineapples.....	300
Dairy cattle.....	83	Phosphate, coal, etc.....	85,833
Fish and oysters.....	4,788	<b>Total.....</b>	<b>104,289</b>
Lumber, plies, etc.....	5,000		
Merchandise.....	1,900		

## (C) CALOOSAHATCHEE RIVER, BETWEEN PUNTARASA AND FORT THOMPSON.

For project, description, etc., see summary, page 337. Nothing but work of maintenance was done during the fiscal year.

Project for expenditure of available funds was approved April 26, 1907. It is proposed to remove snags and trim overhanging trees in the upper river, the work to be done by a chartered boat.

A chartered stern-wheel steamer, temporarily rigged with hoisting gear, commenced operations on May 25, 1907, near Alva, 53 miles above the mouth of the river.

During the fiscal year 746 snags and 9 cubic yards of obstructing rocks were removed and 21 overhanging trees trimmed. The money expended for snagging was \$294.01, for removing rocks \$23.71, and for trimming overhanging trees \$18.38. The average cost of removing snags was 39 cents each, removing rock \$2.63 per cubic yard, and of trimming overhanging trees 90 cents each.

The volume of commerce on Caloosahatchee River, according to statistics, shows an increase of 132 per cent during the year 1906 and 50 per cent increase above the average volume for the past six years.

In past years transportation lines from Fort Myers, the principal town, 18 miles above the mouth of the river, to Key West, Mobile, and Tampa, have been established, but were abandoned on account of insufficient depth in the lower river.

#### Money statement.

Amount appropriated by river and harbor act approved March 2, 1907.	\$2,000. 00
June 30, 1907, amount expended during fiscal year, for maintenance of improvement.....	336. 10
July 1, 1907, balance unexpended.....	1, 663. 90
July 1, 1907, outstanding liabilities.....	917. 81
July 1, 1907, balance available.....	746. 09
<hr/>	
{ Amount that can be profitably expended in fiscal year ending June 30, 1909, for maintenance of improvement, in addition to the balance unexpended July 1, 1907.....	3, 500. 00
{ Submitted in compliance with requirements of sundry civil act of June 4, 1897, and of section 7 of the river and harbor act of 1899.	

#### APPROPRIATIONS.

August 2, 1882.....	\$5, 000
July 5, 1884.....	5, 000
August 5, 1886.....	4, 000
August 11, 1888.....	10, 000
September 19, 1890.....	3, 600
July 13, 1892.....	1, 000
August 18, 1894.....	2, 000
June 3, 1896.....	1, 000
March 3, 1899.....	2, 000
June 13, 1902 (allotted).....	1, 500
March 3, 1905 (allotted).....	2, 000
February 24, 1906, allotted from emergency appropriation, river and harbor act of March 3, 1905.....	2, 000
March 2, 1907 (allotted).....	2, 000
Total .....	41, 100

#### COMMERCIAL STATISTICS.

*Commerce of Caloosahatchee River, Florida, for the year ending December 31, 1906.*

[Compiled from information furnished by Capt. J. F. Menge, Fort Myers, Fla.]

Articles.	Gross tonnage.	Articles.	Gross tonnage.
Cement.....	50	Lumber.....	400
Citrus fruits.....	7, 250	Merchandise, general.....	3, 000
Fertilizer.....	2, 000	Naval stores.....	150
Fish.....	1, 000	Oil and gasoline.....	200
Grain.....	500	Pineapples.....	10
Hay.....	200	Vegetables.....	5, 000
Hides.....	5	Total.....	22, 255
Live stock.....	2, 500		

## P II.

## IMPROVEMENT OF SARASOTA BAY, FLORIDA.

For description, project, and results, see summary, page 338.

At the beginning of the fiscal year dredging operations were in progress with the U. S. dredge *Suwanee* in Little Sarasota Bay under an allotment made on January 27, 1906, from the emergency appropriation of the river and harbor act of March 3, 1905. Work was continued there and in Sarasota Bay until September 11, 1906. There were removed 162.8 cubic yards of rock and 22,260.1 cubic yards of soft material. Result of the work is removal of 5 shoals in the channel of Little Sarasota Bay and 2 in Sarasota Bay.

Project for expenditure of available funds was approved on March 25, 1907. It is proposed to extend the dredged channel from Blackburns Point to Venice (giving it its full width) and (so far as this is possible) in widening the cuts already made to the width prescribed in the project, the work to be done by hired labor, using a Government dredge.

The U. S. dredge *Suwanee* commenced operations on June 5, 1907, at the cut near Blackburns Point, and operations were in progress there at close of the fiscal year. There was dredged 2,717.2 cubic yards of hard, fine sand.

During the fiscal year there was expended a total of \$8,707.33, which includes the cost of laying up, fitting out, and repairing the *Suwanee*. The average cost of removing rock was \$4.25 per cubic yard and of dredging soft material 32 cents.

The volume of commerce in Sarasota Bay increased 40 per cent.

The steamer line between Tampa and Sarasota has been abandoned. No lines of transportation were established.

*Money statement.*

July 1, 1906, balance unexpended.....	\$4,902.91
Amount appropriated by river and harbor act approved March 2, 1907.....	22,500.00
Receipts from sales.....	40.75
	<hr/>
	27,443.66
June 30, 1907, amount expended during fiscal year:	
For works of improvement.....	\$3,804.42
For maintenance of improvement.....	4,902.91
	<hr/>
	8,707.33
July 1, 1907, balance unexpended.....	18,736.33
July 1, 1907, outstanding liabilities.....	2,489.64
	<hr/>
July 1, 1907, balance available.....	16,246.69
	<hr/>
Amount (estimated) required for completion of existing project.....	15,000.00
	<hr/>
{ Amount that can be profitably expended in fiscal year ending June 30, 1909, in addition to the balance unexpended July 1, 1907:	
For works of improvement.....	\$15,000.00
For maintenance of improvement.....	5,000.00
	<hr/>
	20,000.00
Submitted in compliance with requirements of sundry civil act of June 4, 1897, and of section 7 of the river and harbor act of 1899.	

# 1822 REPORT OF THE CHIEF OF ENGINEERS, U. S. ARMY.

## APPROPRIATIONS.

September 19, 1890.....	\$5,000.00
July 13, 1892.....	2,500.00
August 18, 1894.....	2,500.00
June 3, 1896.....	2,500.00
March 3, 1899.....	5,000.00
June 13, 1902.....	5,000.00
March 3, 1905.....	5,000.00
January 27, 1906, allotted from emergency appropriation, river and harbor act of March 3, 1905.....	5,000.00
Sale of old material.....	40.75
March 2, 1907.....	22,500.00
<b>Total .....</b>	<b>55,040.75</b>

## COMMERCIAL STATISTICS.

*Commerce of Sarasota Bay, Florida, for the year ending December 31, 1906.*

[Compiled from information furnished by the Sarasota Board of Trade.]

Articles.	Gross tonnage.	Articles.	Gross tonnage.
Bacon.....	625	Merchandise.....	517
Canned goods.....	300	Naval stores.....	415
Cement.....	150	Oil and gasoline.....	200
Coal.....	25	Oranges.....	260
Fertilizers.....	800	Oysters.....	2
Fish.....	270	Shash, dooms, etc.....	250
Flour.....	380	Shingles.....	120
Grain.....	6,750	Shoes.....	9
Grape fruit.....	120	Sirup, honey, etc.....	15
Hay.....	50	Vegetables.....	150
Hides.....	3		
Lumber.....	20	<b>Total.....</b>	<b>12,010</b>
Lumber, yellow pine.....	480		

*Arrivals and departures of vessels for the year ending December 31, 1906.*

Kind of vessel.	Arrivals.	Departures.
Steamer.....	144	144
Sailing vessel.....	2,555	2,555
Yacht.....	150	150

Estimated percentage of total trade of neighborhood carried by water: 5.  
 Probable increase of trade were the channel improved: 15 to 25 per cent.  
 Probable effect of the channel improvement on freight rates: Reduce same.  
 Transportation lines established during 1906: None.  
 Transportation lines abandoned during 1906: One.

## IMPROVEMENT OF MANATEE RIVER, FLORIDA.

For description, project, etc., see summary, page 339, and Report of the Chief of Engineers for 1905, page 1317.

The river and harbor act of March 2, 1907, appropriated \$70,710 for completing the improvement and for maintenance of Manatee River.

Project for expenditure of available funds was approved on April 13, 1907. It is proposed to obtain a channel 100 feet wide and 9 feet deep at mean low water from McNeills Point to Rocky Bluff, for maintenance of a channel 75 feet wide and 4 feet deep from Rocky Bluff to Rye, and for maintenance of a cut 100 feet wide and 6 feet deep from Manatee River to Terraceia Bay, the work to be done by hired labor, using Government plant. Unless a demand should be made for the depth of 13 feet from Tampa Bay to Shaw and McNeills points, that part (\$27,000) of the appropriation which would be spent there will be held for further Congressional action.

No work was done during the fiscal year, the money expended being for contingencies.

The volume of commerce has increased about 45 per cent.

A new line of steamers was established between Manatee River, St. Petersburg, and Tampa. No lines were abandoned.

#### *Money statement.*

July 1, 1906, balance unexpended.....	\$231. 17
Amount appropriated by river and harbor act approved March 2, 1907.....	70, 710. 00
	<hr/>
	70, 941. 17
June 30, 1907, amount expended during fiscal year, for works of improvement.....	2, 051. 41
	<hr/>
July 1, 1907, balance unexpended.....	68, 889. 76
July 1, 1907, outstanding liabilities.....	420. 77
	<hr/>
July 1, 1907, balance available.....	68, 468. 99
	<hr/>
{ Amount that can be profitably expended in fiscal year ending June 30, 1909, for maintenance of improvement, in addition to the balance unexpended July 1, 1907.....	5, 000. 00
{ Submitted in compliance with requirements of sundry civil act of June 4, 1897, and of section 7 of the river and harbor act of 1899.	

#### APPROPRIATIONS.

August 2, 1882.....	\$12, 000. 00
August 5, 1886.....	11, 000. 00
August 11, 1888.....	5, 000. 00
September 19, 1890.....	6, 000. 00
July 13, 1892.....	6, 000. 00
August 18, 1894.....	3, 000. 00
June 3, 1896 (\$3,000 for Terraceia Cut-off).....	4, 000. 00
March 3, 1899 (\$3,000 for Terracela Cut-off).....	10, 000. 00
June 13, 1902 (allotted for Terracela Cut-off).....	2, 342. 00
March 3, 1905.....	10, 000. 00
Sale of old material.....	8. 80
March 2, 1907.....	70, 710. 00
	<hr/>
Total.....	140, 060. 80

## COMMERCIAL STATISTICS.

*Commerce of Manatee River, Florida, for the year ending December 31, 1906.*

[Compiled from information furnished by Mr. D. B. High, general agent of the Independent Line of steamers, Tampa, Fla.]

Articles.	Gross tonnage.	Articles.	Gross tonnage.
Bacon, salt.....	400	Groceries.....	500
Bananas.....	50	Hardware.....	75
Building material, sash, doors, and blinds.....	1,000	Hay.....	1,000
Canned goods.....	1,500	Hides and skins.....	50
Cattle.....	1,200	Laths.....	75
Cement.....	2,000	Lime.....	675
Charcoal.....	5	Lumber.....	22,500
Cigars.....	1	Meats, smoked, etc.....	10
Cocconuts.....	2	Nails.....	25
Crate material.....	1,250	Naval stores.....	750
Dry goods, shoes, etc.....	75	Oil, kerosene.....	150
Fertilizers.....	1,500	Oranges.....	6,500
Fish.....	50	Salt.....	125
Flour.....	830	Sugar.....	200
Fuller's earth.....	12,000	Tobacco (boxes).....	5
Furniture.....	200	Vegetables.....	15,000
Gasoline.....	300	Wines, liquors, etc.....	100
Grain.....	18,060	Total.....	88,158

Estimated percentage of total trade of neighborhood carried by water: 60.

Probable effect of the channel improvement on freight rates: Some reduction.

Probable increase of trade were the channel improved: 15 to 25 per cent.

Number of steamers in trade: 4. Arrivals and departures: 900, each.

Number of sailing vessels in trade: 10.

Transportation lines established during 1906: 1.

Transportation lines abandoned during 1906: None.

## P 13.

## IMPROVEMENT OF TAMPA BAY, FLORIDA.

For description, project, and results, see summary, page 340.

The river and harbor act of March 3, 1905, authorized expenditure of balance of funds remaining in securing a channel depth of 26 feet, provided that the owners of the docks, wharves, and terminals at Tampa Bay shall, by valid contract, agree to submit the wharfage charges to the Secretary of War for his approval. The schedule of the terminal company was approved on October 26, 1906.

Project for expenditure of available funds was approved by the Secretary of War on December 15, 1906. It is proposed to do half of the work (sections A and B and the lower part of section D) by hired labor, using the U. S. dredges *Key West* and *St. Johns*. The other half of the work (upper part of section D and sections E, F, G, H, J, and K) is to be done by contract, inviting bids in the usual way.

The dredge *Key West* commenced operations on January 30, 1907, and work was in progress at the close of the fiscal year. During the fiscal year this dredge removed 71,711.7 cubic yards from section A



(the outer bar) and 25,775.8 cubic yards from section B at a total cost of \$29,820.69, or 30.59 cents per cubic yard. The result of the work is an increase in depth along the channel areas of about two-tenths foot.

On March 25, 1907, bids were opened for that half of the work to be done by contract. The only proposal received was from the Southern Dredging Company, Mobile, Ala., and the price bid was 34 cents per cubic yard. The Chief of Engineers authorized that the bid be rejected and that the work be readvertised.

One steamship line from Port Tampa to Cuba, one steamship line from Tampa to Cuba, one line of sailing vessels from Tampa to Cuba, and two local steamboat lines have been established.

No transportation lines have been abandoned.

The volume of commerce shows an increase over the last calendar year of 38 per cent.

*Money statement.*

July 1, 1906, balance unexpended.....	\$261, 134. 00
Receipts from sales.....	. 95
	<hr/> 261, 134. 95
June 30, 1907, amount expended during fiscal year for works of improvement.....	31, 934. 77
July 1, 1907, balance unexpended.....	229, 200. 18
July 1, 1907, outstanding liabilities.....	2, 911. 11
	<hr/> 226, 289. 07
{ Amount that can be profitably expended in fiscal year ending June 30, 1909, for maintenance of improvement, in addition to the balance unexpended July 1, 1907.....	15, 000. 00
{ Submitted in compliance with requirements of sundry civil act of June 4, 1897, and of section 7 of the river and harbor act of 1899.	

APPROPRIATIONS.

Under previous projects—		Under present project—	
June 14, 1880.....	\$10, 000. 00	March 3, 1899.....	\$75, 000. 00
March 3, 1881.....	10, 000. 00	June 6, 1900.....	135, 000. 00
August 2, 1882.....	20, 000. 00	March 3, 1901.....	127, 000. 00
July 5, 1884.....	20, 000. 00	June 28, 1902.....	86, 675. 00
August 5, 1886.....	10, 000. 00	March 3, 1903.....	186, 337. 76
August 11, 1888.....	25, 000. 00	Receipts from sales....	. 95
September 19, 1890.....	25, 000. 00		
July 13, 1892.....	10, 000. 00	Total.....	610, 013. 71
Total.....	130, 000. 00		

## COMMERCIAL STATISTICS.

*Commerce of Tampa Bay, Florida, for the year ending December 31, 1906.*

[Compiled from information furnished by Mr. J. W. Morris, general forwarding agent Atlantic Land and Improvement Company.]

Articles.	Gross tonnage.	Articles.	Gross tonnage.
Bacon.....	200	Naval stores.....	28,259
Canned goods.....	2,850	Oil and gasoline.....	78,113
Cement.....	1,300	Oranges.....	300
Coal.....	27,080	Pineapples.....	26
Fertilizers.....	800	Phosphate.....	606,602
Flour.....	19,348	Sash, doors, etc.....	53
Fruits.....	1,560	Shingles.....	20
Grain.....	590	Shoes.....	58
Grape fruit.....	50	Sirup, honey, etc.....	8
Hay.....	450	Tobacco.....	2,163
Live stock.....	2,360	Vegetables.....	780
Lumber, cypress.....	2,900		
Lumber, yellow pine.....	27,193	Total.....	838,378
Merchandise.....	85,370		

*Arrivals and departures of vessels for the year ending December 31, 1906.*

Kind of vessel.	Arrivals.		Departures.	
	Number.	Tons.	Number.	Tons.
Steamers.....	291	65,636	291	445,321
Sailing vessels.....	121	95,251	121	232,170
Yachts.....	3		3	

## P 14.

## IMPROVEMENT OF HILLSBORO BAY, FLORIDA.

For description, projects, and results, see summary, page 341.

At the beginning of the fiscal year dredging operations were in progress under contract entered into on July 26, 1905, with George W. Catt, and continued during the year.

One million one hundred and eighty-four thousand eight hundred and sixty-two cubic yards of soft material were removed. The contract price is 14 cents per cubic yard for dredging soft material, and \$4.90 per cubic yard for removing rock. The total cost, including contingencies, was \$209,065.72. The average cost for dredging was 18 cents. Result of the work is six cuts 20 feet deep at mean low water, 150 feet wide, and an aggregate length of 28,495 feet, and two cuts 20 feet deep, 50 feet wide, and an aggregate length of 330 feet.

The volume of commerce on Hillsboro Bay increased 46 per cent during the year 1906.

Three lines of steamers were established between Tampa and St. Petersburg, Manatee River and New Orleans, respectively, and one schooner line between Tampa and Cuban ports. One new railroad line (Tampa Northern) has been constructed between Tampa and Brooksville (48 miles). No transportation lines have been abandoned.

*Money statement.*

July 1, 1906, balance unexpended.....	\$357, 440. 41
Receipts from sales .....	2. 90
	<hr/>
June 30, 1907, amount expended during fiscal year, for works of im- provement .....	357, 443. 31
	<hr/>
July 1, 1907, balance unexpended.....	209, 065. 72
July 1, 1907, outstanding liabilities.....	148, 377. 59
	<hr/>
July 1, 1907, balance available .....	25, 974. 98
	<hr/>
July 1, 1907, amount covered by uncompleted contracts.....	122, 402. 61
	<hr/>
{ Amount that can be profitably expended in fiscal year ending June 30, 1909, for maintenance of improvement, in addition to the balance unexpended July 1, 1907 .....	54, 494. 29
{ Submitted in compliance with requirements of sundry civil act of June 4, 1897, and of section 7 of the river and harbor act of 1899.	<hr/>
	10, 000. 00

## APPROPRIATIONS.

A list of appropriations made for previous projects in this locality is given in the report for the improvement of Tampa Bay in the Annual Report of the Chief of Engineers for 1899, page 1634.

Project adopted March 3, 1899:	
March 3, 1899.....	\$125, 000. 00
June 13, 1902.....	150, 000. 00
	<hr/>
Total .....	275, 000. 00
Project adopted March 3, 1905:	
March 3, 1905.....	100, 000. 00
June 30, 1906, sundry civil act.....	348, 350. 00
Sale of old material.....	9. 30
Overpayments prior to fiscal year 1905.....	5. 44
Receipts from sales .....	2. 90
	<hr/>
Total .....	448, 367. 64

## CONTRACT IN FORCE.

Contractor: George W. Catt.

Work: Dredging and rock removal.

Date: July 26, 1905.

Approved: August 21, 1905.

Date of beginning: October 4, 1905.

Date of completion: As provided in specifications.

Quantities: Three thousand three hundred cubic yards of rock, at \$4.90 per cubic yard; 2,315,000 cubic yards of sand, mud, etc., at 14 cents per cubic yard.

# 1328 REPORT OF THE CHIEF OF ENGINEERS, U.-S. ARMY.

## COMMERCIAL STATISTICS.

*Commerce of Hillsboro Bay, Florida, for the year ending December 31, 1906.*

[Compiled from information furnished by Hon. J. D. Calhoun, secretary of the Tampa Board of Trade.]

Articles.	Gross tonnage.	Articles.	Gross tonnage.
Artificial stone.....	9,320	Logs, cedar and pine.....	24,821
Bacon, salt.....	663	Lumber, cypress.....	1,425
Bananas.....	4,050	Lumber, pine.....	61,425
Brick.....	8,460	Meats, smoked and cured.....	204
Canned goods.....	7,294	Miscellaneous merchandise, not specified.....	10,000
Cement.....	11,400	Nails.....	1,250
Cigars.....	175	Naval stores.....	2,875
Coal.....	23,700	Oil, machine.....	82
Cocanuts.....	293	Oranges.....	12,825
Crate material.....	9,540	Other fruits.....	2,682
Cross-ties.....	701	Oysters.....	746
Crude petroleum.....	4,679	Phosphate, pebble for paving, etc.....	26,790
Drugs and supplies.....	194	Salt.....	1,350
Dry goods, hats, shoes, etc.....	95	Sand, for artificial stone.....	9,658
Fertilizers.....	35,100	Shingles.....	1,922
Fish.....	8,675	Sugar.....	3,313
Flour.....	5,170	Tobacco, boxes.....	113
Fowls, eggs, etc.....	12,500	Tobacco, bales.....	488
Fuller's earth.....	15,750	Tropical fruits.....	298
Furniture.....	197	Vegetables.....	8,700
Gasoline and light oil.....	1,342	Waters, mineral, etc.....	116
Grain.....	85,750	Wines and liquors.....	492
Hardware, miscellaneous.....	1,050	Wood.....	9,875
Hay.....	15,375	Total.....	449,856
Hides and skins.....	95		
Ice.....	6,800		

*Arrivals and departures of vessels for the year ending December 31, 1906.*

Kind of vessel.	Arrivals.	Departures.
Steamers.....	2,147	2,148 •
Sailing vessels.....	158	158

Number of steamers in trade, 25.

Number of sailing vessels in trade, 73.

This does not include numerous fishing fleets and small craft engaged in local trade.

Number of passengers carried in 1906, 62,700.

Probable increase of trade were the improvement completed, 75 per cent.

Probable effect of the project on freight rates: Decrease same 15 to 20 per cent.

## P 15.

### IMPROVEMENT OF CRYSTAL, ANCLOTE, AND SUWANEE RIVERS, FLORIDA.

The river and harbor act of March 2, 1907, appropriated \$25,000 for continuing improvement and for maintenance of Crystal, Anclote, and Suwanee rivers, Florida.

On May 8, 1907, the Secretary of War made the following allotments from available funds, the appropriation of March 2, 1907, and the balance remaining from the appropriation of March 3, 1905:

To Crystal River.....	\$3,268.31
To Anclote River.....	17,000.00
To Suwanee River.....	8,000.00
Total.....	28,268.31

## (A) CRYSTAL RIVER.

For description, project, and survey report, see summary, page 342, and Report of the Chief of Engineers for 1900, pages 2075-2084.

Project for expenditure of available funds was approved on May 11, 1907. It is proposed to maintain the channel by dredging, the work to be done by hired labor, using Government dredge.

The United States dredge *Florida* commenced operations in Crystal River on August 8, 1906, and ceased dredging on December 6, 1906, as the project was then completed. During the fiscal year there were dredged 47,253.7 cubic yards of sand and shell and 3,434.9 cubic yards of rock. The total cost, including contingencies, was \$12,336.22. The cost per cubic yard for dredging soft material was 18 cents and for removing rock, \$1.14 per cubic yard.

The volume of commerce on Crystal River increased 9 per cent during the year 1906. No lines of transportation were established and none abandoned.

*Money statement.*

July 1, 1906, balance unexpended.....	\$14,636.22
Amount deposited, rent of dredge <i>Florida</i> .....	206.72
	<hr/> 14,842.94
June 30, 1907, amount expended during fiscal year, for works of improvement.....	12,336.22
	<hr/>
July 1, 1907, balance unexpended.....	2,506.72
July 1, 1907, outstanding liabilities.....	640.00
	<hr/>
July 1, 1907, balance available.....	1,866.72

## APPROPRIATIONS.

June 13, 1902 (allotted).....	\$10,000.00
March 3, 1905 (allotted).....	15,000.00
Rent of dredge <i>Florida</i> (October, 1906).....	206.72
	<hr/>
Total.....	25,206.72

## COMMERCIAL STATISTICS.

*Commerce of Crystal River, Florida, for the year ending December 31, 1906.*

[Compiled from information furnished by Mr. C. E. Herrick, Crystal River, Fla.]

Articles.	Gross tonnage.	Articles.	Gross tonnage.
Fiber, palmetto.....	150	Lumber, pine.....	5,256
Fish and oysters.....	250		
General merchandise.....	150	Total.....	8,291
Lumber, cedar.....	2,486		

Number of steamers in trade, 1.

Number of sailing vessels in trade, 6.

Estimated percentage of total trade of neighborhood carried by water, 15.

Probable increase of trade due to completion of project, 15 per cent.

Probable effect of project on freight rates: May cause some reduction.

Transportation lines established or abandoned: None.

## (b) ANCLOTE RIVER.

For description, project, and results, see summary, page 343, and Report of the Chief of Engineers for 1898, pages 1361-1363.

Project for expenditure of available funds was approved May 11, 1907. It is proposed to complete the channel to the width contemplated under the project, so far as this is possible, and to maintenance work; the work to be done by hired labor, using Government dredge.

No work was done during the fiscal year, and no money was expended. No statistics are available for 1906.

*Money statement.*

Amount appropriated by river and harbor act approved March 2, 1907. \$17,000.00

July 1, 1907, balance unexpended.....	17,000.00
July 1, 1907, outstanding liabilities.....	1,100.00

July 1, 1907, balance available.....	15,900.00
Amount (estimated) required for completion of existing project.....	14,500.00

{ Amount that can be profitably expended in fiscal year ending June 30, 1909, for works of improvement, in addition to the balance unexpended July 1, 1907.....	14,500.00
	Submitted in compliance with requirements of sundry civil act of June 4, 1897.

## APPROPRIATIONS.

March 3, 1899.....	\$5,000
June 13, 1902 (allotted).....	10,000
March 3, 1905 (allotted).....	5,000
March 2, 1907 (allotted).....	17,000
Total.....	37,000

## (c) SUWANEE RIVER.

For description, project, and results, see summary, page 343, and Report of the Chief of Engineers for 1906, page 1232.

With funds available from appropriations made previous to March 2, 1907, the following work was accomplished:

The U. S. dredge *Florida* commenced dredging at Derrick Island on December 18, 1906, and ceased dredging there on February 20, 1907. There were removed 39,366.2 cubic yards of sand and shell, containing a few bowlders. Result of the work is one cut 6 feet deep at mean low water, 100 feet wide and 499 feet long, and six cuts of 5.3 feet minimum depth at mean low water, 55 feet width, and aggregate length of 5,580 feet.

On February 21, 1907, dredging commenced at the entrance of Suwanee River and continued until March 16, 1907. There was removed 18,522.3 cubic yards of sand and shell. Result of the work is eight cuts of 5.9 feet minimum depth at mean low water, 55 feet width, and aggregate length of 4,515 feet. The money expended for maintenance was \$8,376.78. The average cost of dredging was 14 cents per cubic yard.

A 24-ton stern-wheel towboat, drawing about 2 feet, towing rafts of cypress logs from the river to a sawmill near Cedar Keys, is the only craft operating on the lower part of Suwanee River. There are two small steamers operating on the upper river in vicinity of Branford.

No commercial statistics for the year 1906 are available.

No lines of transportation were established nor any abandoned.

*Money statement.*

July 1, 1906, balance unexpended.....	\$8, 278. 76
Amount appropriated by river and harbor act approved March 2, 1907.....	8, 000. 00
	<hr/> 16, 278. 76
June 30, 1907, amount expended during fiscal year, for maintenance of improvement.....	8, 378. 76
	<hr/> 7, 900. 00
July 1, 1907, balance unexpended.....	<hr/> 7, 900. 00
<hr/>	
{ Amount that can be profitably expended in fiscal year ending June 30, 1909, for maintenance of improvement, in addition to the balance unexpended July 1, 1907.....	5, 000. 00
{ Submitted in compliance with requirements of sundry civil act of June 4, 1897, and of section 7 of the river and harbor act of 1890.	

APPROPRIATIONS.

June 14, 1880.....	\$5, 000. 00	June 3, 1896.....	\$3, 000. 00
March 3, 1881.....	3, 000. 00	March 3, 1899.....	5, 000. 00
August 2, 1882.....	5, 000. 00	June 13, 1902 (allotted)....	7, 658. 00
July 5, 1884.....	5, 000. 00	March 3, 1905 (allotted)....	5, 000. 00
August 5, 1886.....	5, 000. 00	For rent of dredge.....	78. 90
August 11, 1888.....	15, 000. 00	March 2, 1907 (allotted)....	8, 000. 00
September 19, 1890.....	3, 000. 00		
July 13, 1892.....	3, 000. 00		
August 18, 1894.....	3, 000. 00	Total.....	<hr/> 75, 736. 90

P 16.

IMPROVEMENT OF WITHLACOOCHEE RIVER, FLORIDA.

For description, survey, etc., see summary, page 345.

Project for expenditure of available funds was approved April 25, 1907. It is proposed to let the work by contract, after due advertisement, for the total amount of the work or such portion of it as at the contract price may be done with the funds appropriated and authorized.

No work was done during the year and no money was expended.

The volume of commerce on Withlacoochee River decreased 27 per cent during the year ending December 31, 1906. The quantity of phosphate shipped was 78,369 tons less than in 1905 and other articles were 9,711 tons greater than in 1905. The decrease in phos-

phate was wholly due to a long wet season that made it impossible to operate the mines for many weeks.

No lines of transportation were established nor any abandoned.

### Money statement.

Amount appropriated by river and harbor act approved March 2, 1907.<sup>a</sup> \$65,400.00  
 July 1, 1907, balance unexpended..... 65,400.00

Amount (estimated) required for completion of existing project..... 150,000.00

{ Amount that can be profitably expended in fiscal year ending June 30, 1909, for works of improvement, in addition to the balance unexpended July 1, 1907..... 150,000.00  
 Submitted in compliance with requirements of sundry civil act of June 4, 1897.

### APPROPRIATIONS.

March 3, 1881.....	\$7,500.00	June 13, 1902 (allotted) ..	\$5,000.00
July 5, 1884.....	3,000.00	March 3, 1905 (allotted) ..	15,000.00
August 5, 1886.....	3,000.00	Overpayment on voucher,	
August 11, 1888.....	5,000.00	fiscal year 1905.....	.41
September 19, 1890.....	<sup>b</sup> 5,400.00	March 2, 1907.....	65,400.00
August 18, 1894.....	800.00		
June 13, 1902.....	15,000.00	Total .....	125,100.41

### COMMERCIAL STATISTICS.

*Commerce of Withlacoochee River, Florida, for the year ending December 31, 1906.*

[Compiled from information furnished by Mr. A. G. Bigelow, manager Dunnellon Phosphate Company, Rockwell, Fla.]

Articles.	Gross tonnage.	Articles.	Gross tonnage.
Bacon.....	158	Naval stores.....	42
Canned goods.....	63	Oil and gasoline.....	33
Cement.....	6	Phosphate.....	158,952
Coal.....	3,899	Railroad supplies.....	704
Fertilizers.....	2,344	Sash, doors, and blinds.....	2
Fish and oysters.....	44	Shingles.....	14
Flour.....	110	Shoes.....	2
Grain.....	272	Sirup, honey, etc.....	11
Hay.....	264	Tobacco.....	3
Iron pyrites.....	10,154	Vegetables.....	5
Lumber, yellow pine.....	3,833		
Merchandise.....	511	Total .....	181,226

<sup>a</sup> And continuing contract for \$150,000 additional.

<sup>b</sup> \$150,000 additional authorized for continuing contract.



*Arrivals and departures of vessels for the year ending December 31, 1906.*

Kind of vessels.	Arrivals.		Departures.	
	Number.	Tons.	Number.	Tons.
Steamers.....	64	13,063	64	158,068
Sailing vessels.....	15	2,278	15	7,092
Yachts.....	18	.....	18	.....

Estimated percentage of total trade of neighborhood carried by water, 35.

Probable increase of trade were the channel improved, 40 per cent.

Probable effect of the channel improvement on freight rates: Some decrease.

Transportation lines established during 1906: None.

Transportation lines abandoned during 1906: None.

## P 17.

## REMOVING THE WATER HYACINTH FROM FLORIDA WATERS.

During the fiscal year the work of removing water hyacinths was confined to the Withlacoochee and Kissimmee rivers.

Work on the Withlacoochee River, which had been temporarily suspended in May, 1906, on account of low water, was resumed September 17. Several sloughs and inlets were closed with log booms and about 3 miles of the river were practically cleared of the obstruction. Work ceased on October 31, owing to exhaustion of funds. The total cost was \$1,450.63.

Work on the Kissimmee River, which was in progress at the beginning of the fiscal year, was continued until August 25, when it ceased owing to exhaustion of funds. Many sloughs and inlets were closed with log booms, and about 5 miles of the river were practically cleared of the obstruction. The total cost of the work was \$2,581.24.

A new hull was built for the U. S. steamer *Le Reve*, and new machinery installed on the boat preparatory to beginning work of removing the plant from St. Johns River and tributaries, and an examination was made to determine where the plant is most obstructive. The amount expended, including incidentals, was \$4,887.19.

*Money statement.*

July 1, 1906, balance unexpended.....	\$18,582.82
Amount appropriated by river and harbor act approved March 2, 1907.....	15,000.00
Receipts from sales.....	8.00
	<hr/>
June 30, 1907, amount expended during fiscal year, for works of improvement.....	33,590.82
	<hr/>
July 1, 1907, balance unexpended.....	8,919.06
July 1, 1907, outstanding liabilities.....	24,671.76
	<hr/>
July 1, 1907, balance available.....	811.58
	<hr/>
July 1, 1907, balance available.....	23,860.18
	<hr/>
Amount (estimated) required for completion of existing project.....	Indefinite.
	<hr/>
{ Amount that can be profitably expended in fiscal year ending June 30, 1909, for works of improvement, in addition to the balance unexpended July 1, 1907.....	45,000.00
{ Submitted in compliance with requirements of sundry civil act of June 4, 1897.	

## APPROPRIATIONS.

Act of March 3, 1899:	
For construction of boat-----	\$25, 000
For log booms-----	1, 000
For operating expenses-----	10, 000
Act of June 13, 1902:	
For removal of water hyacinth from the navigable waters of the States of Florida, Texas, and Louisiana, \$50,000; allotted for Florida-----	25, 000
Emergency river and harbor act of April 28, 1904-----	25, 000
Act of March 3, 1905:	
For removing the water hyacinth from the navigable waters of Florida-----	25, 000
Receipts from sales-----	8
Act of March 2, 1907-----	15, 000
Total-----	126, 008

## CONTRACT IN FORCE.

Contractor: W. M. Boyd.  
 Work: Constructing hull for steamer *Le Reve*.  
 Date: June 30, 1906.  
 Date of beginning: July 10, 1906.  
 Date of completion: December 10, 1906.

## APPENDIX Q.

### IMPROVEMENT OF RIVERS AND HARBORS IN WESTERN GEORGIA AND FLORIDA AND IN EASTERN ALABAMA.

REPORT OF CAPT. J. B. CAVANAUGH, CORPS OF ENGINEERS, OFFICER  
IN CHARGE, FOR THE FISCAL YEAR ENDING JUNE 30, 1907.

#### IMPROVEMENTS.

- |  |  |
|--|--|
| 1. Carrabelle Bar and Harbor, Florida.                             | 8. Blackwater River, Florida.  |
| 2. Apalachicola Bay, Florida.                                      | 9. Pensacola Harbor, Florida.  |
| 3. Apalachicola River, the Cut-off, and<br>Chipola River, Florida. | 10. Escambia and Conecuh rivers,<br>Florida and Alabama.   |
| 4. Flint River, Georgia.   | 11. Alabama River, Alabama.  |
| 5. Chattahoochee River, Georgia and<br>Alabama.                    | 12. Coosa, Oostenaula, and Coosawat-<br>tee rivers, Georgia and Alabama.                                       |
| 6. Choctawhatchee River, Florida and<br>Alabama.                   | 13. Operating and care of canals and<br>other works of navigation on<br>Coosa River, Georgia and Ala-<br>bama. |
| 7. Holmes River, Florida, from Vernon<br>to its mouth.             |  |

UNITED STATES ENGINEER OFFICE,  
*Montgomery, Ala., July 9, 1907.*

GENERAL: I have the honor to forward herewith \* \* \* annual  
reports of the river and harbor works under my charge \* \* \* for  
the fiscal year ending June 30, 1907.

\* \* \* \* \*

Very respectfully, your obedient servant,

J. B. CAVANAUGH,  
*Captain, Corps of Engineers.*

Brig. Gen. A. MACKENZIE,  
*Chief of Engineers, U. S. A.*

#### Q 1.

### IMPROVEMENT OF EAST PASS AND CARRABELLE BAR AND HARBOR, FLORIDA.

A description of the locality, its original condition, the projects for  
improvement, and the present condition of the channel across the bar  
at the river mouth and at East Pass are stated in the Annual Report  
of the Chief of Engineers for 1907, page 348.

Reference to description of work done prior to June 30, 1900, will be found on page 1242, Annual Report of the Chief of Engineers for 1906.

#### OPERATIONS DURING THE FISCAL YEAR ENDING JUNE 30, 1907.

A survey was made of the bar at the mouth of the river to determine the best location for the new 18-foot channel provided for by the river and harbor act of March 2, 1907, and the amount of material to be removed. Proposals were invited May 31, 1907, for completing the channel across this bar from the wharves at Carrabelle to the 18-foot curve and St. George Sound, including a small turning basin, and will be opened July 1, 1907.

#### RECOMMENDATIONS.

It is expected that funds now available will be sufficient for the completion of work upon the bar at the river mouth, but the deepening of East Pass is also important to both present and prospective commerce. An increased depth of water through East Pass will secure much better rates of freight and insurance for the commerce now using Carrabelle Harbor, and much better inducements will be offered to prospective commerce. Therefore the funds necessary for completing this part of the approved project should be provided.

#### *Money statement.*

July 1, 1906, balance unexpended.....	\$8, 105. 87
Amount appropriated by river and harbor act approved March 2, 1907.....	60, 000. 00
	<hr/> 68, 105. 87
June 30, 1907, amount expended during fiscal year:	
For works of improvement.....	\$3, 114. 74
For maintenance of improvement.....	2, 500. 00
	<hr/> 5, 614. 74
July 1, 1907, balance unexpended.....	62, 491. 13
July 1, 1907, outstanding liabilities.....	1, 545. 88
	<hr/> 60, 945. 25
<hr/>	
{ Amount that can be profitably expended in fiscal year ending June 30, 1909, in addition to the balance unexpended July 1, 1907:	
For works of improvement.....	\$40, 000. 00
For maintenance of improvement.....	5, 000. 00
	<hr/> 45, 000. 00
{ Submitted in compliance with requirements of sundry civil act of June 4, 1897, and of section 7 of the river and harbor act of 1899.	

#### APPROPRIATIONS.

June 3, 1896.....	\$10, 000. 00	April 28, 1904 (allotment).....	\$5, 000. 00
March 3, 1899.....	10, 000. 00	March 3, 1905.....	15, 000. 00
June 6, 1900 (allotment).....	1, 704. 08	March 2, 1907.....	60, 000. 00
June 13, 1902.....	20, 000. 00		
June 13, 1902 (allotment).....	7, 500. 00	Total.....	129, 204. 08

## COMMERCIAL STATISTICS.

The commerce of this port is so combined with that of Apalachicola that a separation is impracticable, and reference is made to report upon the improvement of harbor at Apalachicola Bay, Florida, for detailed statistics.

## Q 2.

## IMPROVEMENT OF APALACHICOLA BAY, FLORIDA.

A description of this locality, its original and present conditions, and the project for improvement are given in the Annual Report of the Chief of Engineers for 1907, page 349.

Reference to work done prior to June 30, 1903, will be found in the Annual Report of the Chief of Engineers for 1906, page 1243.

## OPERATIONS DURING THE FISCAL YEAR ENDING JUNE 30, 1907.

A survey was made of the bar at the mouth of the river to determine the amount of dredging required to secure a channel of project dimensions across this bar, and an examination was made of Link channel to determine its present condition, which was found to be practically unchanged. Proposals were invited on May 31, 1907, for dredging the channel at the mouth of the river, and will be opened on July 1, 1907.

## RECOMMENDATIONS.

The existing commerce of Apalachicola requires that the West Pass entrance be opened for a draft of 18 feet, and that a good barge channel be secured to connect West Pass anchorage with the city, and that these channels be properly maintained.

The appropriations thus far expended have been insufficient to thoroughly dredge any part of the improvement and have all been practically absorbed in maintenance, but funds now available are ample to fully complete the barge channel at the mouth of the river. Additional funds are required for dredging at West Pass and for maintenance.

*Money statement.*

July 1, 1906, balance unexpended.....	\$9,419.23
Amount appropriated by river and harbor act approved March 2, 1907.....	85,000.00
	<hr/>
	94,419.23
June 30, 1907, amount expended during fiscal year, for maintenance of improvement.....	9,598.49
	<hr/>
July 1, 1907, balance unexpended.....	84,820.74
July 1, 1907, outstanding liabilities.....	32.76
	<hr/>
July 1, 1907, balance available.....	84,787.98
	<hr/>
Amount (estimated) required for completion of existing project.....	25,000.00
	<hr/>
{ Amount that can be profitably expended in fiscal year ending June 30, 1909, in addition to the balance unexpended July 1, 1907:	
For works of improvement.....	\$25,000.00
For maintenance of improvement.....	25,000.00
	<hr/>
	50,000.00
{ Submitted in compliance with requirements of sundry civil act of June 4, 1897, and of section 7 of the river and harbor act of 1899.	

# 1388 REPORT OF THE CHIEF OF ENGINEERS, U. S. ARMY.

## APPROPRIATIONS.

March 2, 1833.....	\$8, 700	
July 4, 1836.....	10, 000	
March 3, 1839.....	9, 900	
		\$28, 600
June 14, 1880.....	10, 000	
March 3, 1881.....	10, 000	
August 2, 1882.....	25, 000	
July 5, 1884.....	10, 000	
August 5, 1886.....	12, 000	
August 11, 1888.....	20, 000	
September 19, 1890.....	20, 000	
July 13, 1892.....	20, 000	
August 18, 1894.....	15, 000	
June 3, 1896.....	12, 000	
		154, 000
March 3, 1899.....	20, 000	
June 13, 1902.....	40, 000	
April 28, 1904 (allotment).....	12, 500	
April 28, 1904 (allotment).....	5, 000	
March 3, 1905.....	40, 000	
March 3, 1905 (allotment).....	7, 500	
March 3, 1905 (allotment).....	2, 500	
June 13, 1902 (allotment).....	3, 000	
March 2, 1907.....	85, 000	
		215, 500
Total.....		398, 100

## COMMERCIAL STATISTICS FOR PORT OF APALACHICOLA, FLA., FROM JULY 1, 1906, to JUNE 30, 1907.

Exports to foreign ports.....	\$320, 484. 00
Exports to coastwise ports.....	720, 000. 00
Imports from foreign ports.....	9. 30
Duties on imports.....	3. 30
Total.....	1, 040, 496. 60

	Number.	Tons.
Vessels entered from foreign ports.....	51	24, 861
Vessels entered from coastwise ports (estimated).....	75	24, 017
Total.....	126	48, 878
Vessels cleared for foreign ports.....	88	17, 182
Vessels cleared for coastwise ports (estimated).....	81	26, 799
Total.....	119	43, 981
Vessels engaged in traffic of the port:		
Steam.....	32	1, 925
Sail.....	25	265
Total.....	57	2, 190

Amount of fees, dues, and duties paid during the year, \$1,198.24.

## Freight carried.

Articles.	Quantity.	Value.
Lumber (export).....feet B. M..	23, 061, 000	\$538, 521
Miscellaneous (duty added).....		195, 000
Total.....		733, 521

This statement, obtained from the records of the custom-house at Apalachicola, Fla., includes vessels loaded from both Apalachicola and Carrabelle, Fla., all of which use the entrance at East Pass, Carrabelle Harbor. Of the total commerce, probably 40 per cent should be credited to Carrabelle. In addition there is a large commerce in fish, oysters, coal, naval stores, and miscellaneous merchandise carried in vessels not required to report at the custom-house and of which no accurate record is kept. This amounts to probably 40,000 tons, the value of which is estimated to be \$800,000 per annum. Similar commerce at Carrabelle will probably exceed \$250,000 in value.

### Q 3.

#### IMPROVEMENT OF APALACHICOLA RIVER, FLORIDA, INCLUDING THE CUT-OFF AND LOWER CHIPOLA RIVER AND THE UPPER CHIPOLA RIVER FROM MARIANNA TO ITS MOUTH.

Description of these rivers, statement of project for their improvement, and facts concerning their original and present condition are given in the Annual Report of the Chief of Engineers for 1907, page 351.

Reference to work done upon the rivers may be found in Annual Report of the Chief of Engineers for 1906, page 1246.

#### OPERATIONS DURING THE FISCAL YEAR ENDING JUNE 30, 1907.

On November 15, 1906, an emergency allotment of \$5,000 was made for work in the cut-off and lower Chipola River, and with this allotment and funds from the regular appropriations the following work was done by the snag boat *Chattahoochee* and the dipper dredge belonging to the Chattahoochee River improvement:

##### (A) APALACHICOLA RIVER.

The Apalachicola River proper was cleared of all obstructions, the work done being as follows:

Snags and stumps removed.....	2
Overhanging trees removed.....	1, 133
Bushes cut.....	764
At a field cost of \$307.47.	

##### (B) CUT-OFF AND LOWER CHIPOLA RIVER.

This section was cleared of obstructions and its condition permanently improved.

The dipper dredge removed 46,297 cubic yards of material, 70 snags, 25 logs, and 309 stumps, at a field cost of \$3,066.06, or about 6 cents per yard for the dredging.

The snag boat *Chattahoochee* removed the following obstructions:

Snags.....	748
Stumps.....	123
Logs.....	41
Overhanging trees.....	1, 160
Bushes cut.....	6, 479

At a field cost of \$3,440.20.

## (C) UPPER CHIPOLA RIVER.

The snag boat *Thronateeska* was extensively repaired on the ways at Apalachicola and taken to the upper end of the Dead Lakes. She was fitted out and commenced operations on June 3, 1907. During the remainder of the month her work was as follows:

Overhanging trees cut.....	96
Bushes cut.....	77
Stumps removed.....	91
Logs removed.....	37
Snags removed.....	367

At a field cost of \$741.90.

## RECOMMENDATIONS.

The Apalachicola River requires the removal of the annual accumulation of logs, snags, and overhanging trees. The cut-off, Lee Slough, and lower Chipola River require the removal of obstructions and dredging, particularly at the sharp bends and narrow places, and since there are no important landings on the corresponding section of the old river it is advisable to increase the size of the new channel as rapidly as possible.

The upper Chipola River, now made part of this improvement, requires the removal of snags, logs, overhanging trees, and cypress trees and stumps between Look and Tremble shoal and the foot of the Dead Lakes at the lower Chipola River and the dredging and regulation of a channel through the mud bar at Sister Islands. This work will open up a waterway from the Apalachicola River system to Look and Tremble shoal, about 45 miles below Marianna. To extend the improvement further would require the construction of at least one lock and dam and very expensive channel work over rock shoals; therefore no further work than above outlined is recommended, as the river above Look and Tremble shoal is now in satisfactory condition for rafting.

*Money statements.*

## APALACHICOLA RIVER.

July 1, 1906, balance unexpended.....	\$182. 43
Amount appropriated by river and harbor act approved March 2, 1907.....	1, 000. 00
	<hr/>
	1, 182. 43
June 30, 1907, amount expended during fiscal year, for maintenance of improvement.....	182. 43
	<hr/>
July 1, 1907, balance unexpended.....	1, 000. 00
July 1, 1907, outstanding liabilities.....	37. 16
	<hr/>
July 1, 1907, balance available.....	962. 84
	<hr/>
{ Amount that can be profitably expended in fiscal year ending June 30, 1909, for maintenance of improvement, in addition to the balance unexpended July 1, 1907.....	
{ Submitted in compliance with requirements of sundry civil act of June 4, 1897, and of section 7 of the river and harbor act of 1890.	
	1, 000. 00



## LOWER APALACHICOLA RIVER.

July 1, 1906, balance unexpended.....	\$109. 84
Amount appropriated by river and harbor act approved March 2, 1907..	15, 000. 00
Amount allotted by emergency act.....	5, 000. 00
	<hr/> 20, 109. 84
June 30, 1907, amount expended during fiscal year, for maintenance of improvement.....	6, 398. 60
July 1, 1907, balance unexpended.....	13, 711. 24
Amount (estimated) required for completion of existing project....	5, 000. 00
<hr/>	
{ Amount that can be profitably expended in fiscal year ending June 30, 1909, in addition to the balance unexpended July 1, 1907:	
For works of improvement.....	\$5, 000. 00
For maintenance of improvement.....	9, 000. 00
	<hr/> 14, 000. 00
{ Submitted in compliance with requirements of sundry civil act of June 4, 1897, and of section 7 of the river and harbor act of 1899.	

## UPPER CHIPOLA RIVER.

July 1, 1906, balance unexpended.....	\$868. 94
Amount appropriated by river and harbor act approved March 2, 1907..	9, 000. 00
	<hr/> 9, 868. 94
June 30, 1907, amount expended during fiscal year, for maintenance of improvement.....	2, 367. 94
July 1, 1907, balance unexpended.....	7, 501. 00
July 1, 1907, outstanding liabilities.....	824. 39
July 1, 1907, balance available.....	6, 676. 61
Amount (estimated) required for completion of existing project....	30, 000. 00
<hr/>	
{ Amount that can be profitably expended in fiscal year ending June 30, 1909, for works of improvement, in addition to the balance unex- pended July 1, 1907.....	
	5, 000. 00
{ Submitted in compliance with requirements of sundry civil act of June 4, 1897.	

## CONSOLIDATED.

July 1, 1906, balance unexpended.....	\$1, 161. 21
Amount appropriated by river and harbor act approved March 2, 1907..	25, 000. 00
Amount allotted by emergency river and harbor act.....	5, 000. 00
	<hr/> 31, 161. 21
June 30, 1907, amount expended during fiscal year, for maintenance of improvement.....	8, 948. 97
July 1, 1907, balance unexpended.....	22, 212. 24
July 1, 1907, outstanding liabilities.....	861. 55
July 1, 1907, balance available.....	21, 350. 69
Amount (estimated) required for completion of existing project....	35, 000. 00
<hr/>	
{ Amount that can be profitably expended in fiscal year ending June 30, 1909, in addition to the balance unexpended July 1, 1907:	
For works of improvement.....	\$10, 000. 00
For maintenance of improvement.....	10, 000. 00
	<hr/> 20, 000. 00
{ Submitted in compliance with requirements of sundry civil act of June 4, 1897, and of section 7 of the river and harbor act of 1899.	

## APPROPRIATIONS.

## APALACHICOLA RIVER.

May 23, 1828.....	\$3, 000	July 13, 1892.....	\$5, 000
April 23, 1830.....	2, 000	August 18, 1894.....	5, 000
March 2, 1831.....	8, 000	June 3, 1896.....	5, 000
June 23, 1874.....	10, 000	March 3, 1899.....	3, 000
March 3, 1875.....	10, 000	June 6, 1900 (allotment).....	1, 500
June 18, 1878.....	8, 000	June 13, 1902.....	6, 000
March 3, 1879.....	5, 000	June 13, 1902 (allotment).....	3, 750
June 14, 1880.....	2, 000	March 3, 1905.....	12, 000
March 3, 1881.....	1, 500	November 15, 1906 (emergency allotment).....	5, 000
August 2, 1882.....	2, 000	March 2, 1907.....	25, 000
July 5, 1884.....	1, 000		
August 5, 1886.....	1, 000		
September 11, 1888.....	2, 000		
September 19, 1890.....	2, 000	Total.....	128, 750

## UPPER CHIPOLA RIVER FROM MARIANNA TO ITS MOUTH.

March 3, 1899.....	\$5, 000
June 13, 1902.....	2, 000
March 3, 1905 (allotment).....	4, 000
Total.....	11, 000

## COMMERCIAL STATISTICS.

The commerce of this river is chiefly cotton, naval stores, general merchandise, saw logs, and timber for export. This river runs through a section of country where there are no railroads, and the country bordering upon it depends largely on the steamboats for transportation of products and supplies. There is also a large passenger traffic on the stream.

Reference is made to report on the Flint River improvement for detailed statistics.

## Q 4.

## IMPROVEMENT OF FLINT RIVER, GEORGIA.

For previous history, statement of project, and present conditions, see Annual Report of the Chief of Engineers for 1907, page 354.

For references to the detailed reports of past operations, see Annual Report of the Chief of Engineers for 1906, page 1248.

## OPERATIONS DURING THE FISCAL YEAR ENDING JUNE 30, 1907.

Operations during the fiscal year have been confined practically to the section of river between Newton, Ga., and Bainbridge, Ga. During the year the initial improvement to a width of 60 feet was extended as far down as Dry Bread shoals,  $7\frac{1}{2}$  miles below Newton, and the condition of these shoals materially improved. Operations were then transferred about 10 miles lower down the river to Flat Rock and Maple Chute, and the channel improved for about 2 miles over

<sup>a</sup> Includes \$4,000 allotted for upper Chipola River.

these shoals. For the greater part of this distance excavation through rock was required. Just before work was suspended for high water, the plant removed a few obstructing points at Tea Cup shoals. Work was resumed at Dry Bread shoals in June, 1907, and the completion of the channel there will practically extend the 60-foot channel to Sycamore shoals,  $17\frac{1}{2}$  miles below Newton. In addition to this rock work, all snags and similar obstructions were removed from the section of river below Bainbridge by the snag boat.

The actual work done during the year is as follows:

Rock excavation:	Cubic yards.
Tea Cup shoals.....	100
Dry Bread shoals.....	1,384
Flat Rock shoals.....	1,169
Maple Chute.....	696

At a field cost of \$6,362.88, or about \$1.90 per cubic yard.

Snag-boat work:	Number.
Trees removed.....	472
Snags removed.....	138
Stumps removed.....	136
Logs removed.....	61

At a field cost of \$491.66.

#### RECOMMENDATIONS.

It is recommended that for the present work be confined to the river below Newton, Ga., and include the enlargement of channels through rock reefs and the removal of bowlders between Newton and Bainbridge; the removal of isolated bowlders below Bainbridge, and such snagging operations as may be required for maintenance.

It is proposed to expend the funds now on hand in constructing a small grapple dredge and work with the drilling barge and this dredge between Newton and Bainbridge and to apply the funds recommended in continuing such work.

#### Money statement.

July 1, 1906, balance unexpended.....	\$14,626.98
Amount appropriated by river and harbor act approved March 2, 1907.....	25,000.00
	<hr/> 39,626.98
June 30, 1907, amount expended during fiscal year:	
For works of improvement.....	\$9,207.40
For maintenance of improvement.....	1,000.00
	<hr/> 10,207.40
July 1, 1907, balance unexpended.....	29,419.58
July 1, 1907, outstanding liabilities.....	915.34
	<hr/> 28,504.24
July 1, 1907, balance available.....	<hr/> 62,500.00
Amount (estimated) required for completion of existing project.....	<hr/> 62,500.00
Amount that can be profitably expended in fiscal year ending June 30, 1909, in addition to the balance unexpended July 1, 1907:	
For works of improvement.....	\$17,500.00
For maintenance of improvement.....	2,500.00
	<hr/> 20,000.00
Submitted in compliance with the requirements of sundry civil act of June 4, 1897, and of section 7 of the river and harbor act of 1899.	

## APPROPRIATIONS.

June 23, 1874	\$18,000	September 19, 1890	\$20,000
March 3, 1875		July 13, 1892	15,000
August 14, 1876		August 18, 1894	8,000
June 18, 1878	10,000	June 3, 1896	8,000
March 3, 1879	7,000	March 3, 1899	5,000
June 14, 1880	20,000	June 13, 1902	25,000
March 3, 1881	15,000	March 3, 1905	20,000
August 2, 1882	25,000	March 2, 1907	25,000
July 5, 1884	20,000		
August 5, 1886	20,000	Total	281,000
August 11, 1888	20,000		

## COMMERCIAL STATISTICS.

The commerce of this stream is principally cotton, naval stores, and lumber. There are great quantities of fine timber along the banks of the river, mainly pine, cypress, and hard wood.

When the river is made navigable from Albany to Bainbridge the entire year, it will greatly benefit these industries and new ones will spring up along the river.

*Statement of business done by the Albany and Gulf Navigation Company.*

Stern-wheel steamboat.	Regis- tered tonnage.	Draft.		Between—	Passen- gers.
		Light.	Loaded.		
Raymond H .....	55	<i>Inches.</i> 18	<i>Inches.</i> 36	Albany, Ga., and Newton, Ga .....	None.

*Freight carried.*

Articles.	Quantity.	Tons.
Cotton .....	bales.. 5,000	1,250
Cotton seed .....	..sacks.. 50,000	2,500
Cotton-seed meal .....	..do.. 2,000	100
Fertilizers .....	..do.. 15,000	1,500
Oats .....	..do.. 1,040	894
Corn .....	..do.. 1,000	70
Hay .....	bales.. 2,080	104
Wool .....	..do.. 8	2
Rosin .....	barrels.. 5,200	1,300
Turpentine .....	..do.. 1,300	273
Flour .....	..do.. 50	5
Do .....	sacks.. 2,080	204
Sugar .....	barrels.. 800	51
Bagging .....	bundles.. 800	40
Ties .....	..do.. 1,200	30
General miscellaneous .....	packages.. 1,000	5
Hides and skins .....	bundles.. 52	3
Live stock .....	head.. 2	1
Lumber .....	feet B. M.. 50,000	100
Provisions (case goods) .....	packages.. 5,000	75
Coffee .....	sacks.. 480	30
Corn meal .....	..do.. 2,400	58
Bacon, smoked and dry salted .....	boxes.. 238	144
Salt .....	sacks.. 1,200	60
Lard .....	packages.. 480	12
Soap .....	boxes.. 2,400	120
Nails .....	kegs.. 480	24
Brick .....	number.. 50,000	100
Total .....		8,245

Estimated value of above freights (in round numbers), \$850,000.

Between Bainbridge, Ga., and the mouth of the river the stream is used for the steamers plying the Chattahoochee, Apalachicola, and Chipola rivers, and for the commerce of this entire system reference is made to the following tables:

Stern-wheel steamboats.	Registered tonnage.	Draft.		Round trips.	Between—	Passengers.
		Light.	Loaded.			
		<i>Inches.</i>	<i>Feet.</i>			
M. W. Kelly.....	185	24	4½	44	Columbus and Apalachicola....	5,375
Queen City.....	150	24	4	10	.....do.....	1,175
W. C. Bradley.....	175	24	4	49	.....do.....	6,590
Ruth No. 2.....	141	18	8	56	Bainbridge and Apalachicola....	14,000
Gertrude.....	218	24	8½	14	.....do.....	2,000
W. H. Hales.....	60	18	8	156	.....do.....	350

*Freight carried.*

Articles.	Quantity.	Tons.
Cotton.....bales.....	12,412	3,358
Cotton seed.....sacks.....	40,820	2,041
Cotton-seed meal.....do.....	29,700	1,035
Fertilizers.....do.....	49,830	4,483
Corn and oats.....do.....	53,105	4,129
Rosin.....barrels.....	51,410	12,863
Turpentine.....do.....	20,835	4,216
Molasses.....do.....	4,589	918
General miscellaneous.....packages.....	327,092	52,393
Hides and skins.....do.....	1,399	71
Live stock.....head.....	596	223
Lumber.....feet B. M.....	878,000	1,756
Provisions (case goods).....packages.....	290,835	27,714
Gravel.....yards.....	1,400	2,240
Shingles.....number.....	5,258,000	1,510
Brick.....do.....	830,000	1,975
Total.....		120,900

Estimated value of above freights (in round numbers), \$13,510,750.

In addition to the above, large quantities of timber are carried down these streams in rafts to sawmills at Apalachicola and Carrabelle, Fla., for which no value is given, as no record of the amount is available, but it is included in the general value of the commerce reported for Carrabelle and Apalachicola, Fla.

**Q 5.**

**IMPROVEMENT OF CHATTAHOOCHEE RIVER, GEORGIA AND ALABAMA.**

For description and statement of project, see Annual Report of the Chief of Engineers for 1907, page 356.

For references to reports of past operations, see Annual Report of the Chief of Engineers for 1906, page 1251.

**OPERATIONS DURING THE FISCAL YEAR ENDING JUNE 30, 1907.**

Work during the year has been principally confined to improvement and maintenance by dredging, no jetty construction being undertaken

until June, 1907, at the commencement of the present season. Channels 4 to 5 feet deep and about 100 feet wide were dredged at Burdocks Landing, Indian Mound, Slick Bluff, Halls Lower Landing, Halls Upper Landing, Owen Thomas Bluff, Uchee Island, and Roods Bend.

The snag boat *Flint* worked over the entire river below Columbus, removing all snags and similar obstructions.

The snag boat *Chattahoochee* was employed principally in blasting marl reefs, towing and unloading barges in connection with dredging operations, and other miscellaneous towing.

Jetty construction was commenced in June, and piles were driven for 175 linear feet of jetty at Woolfolk's bar and 546 feet at Uchee Island, and these jetties partly filled with brush and stone. A derrick, hoisting engine, and other plant were installed at quarry on shoals at Columbus and 336 cubic yards of stone gotten out.

The snag boat *Flint*, the towboat *Columbus*, and two rock barges were docked and repaired at Apalachicola, Fla., and minor repairs necessary for maintenance of the remainder of the plant also made. A quarter boat and a small barge were partially constructed at Columbus by hired labor.

The following is a detailed statement of the most important items of the season's work:

Dredging 20,225 cubic yards of marl, at a field cost, including blasting and handling on scows, of \$7,184.90, or, approximately, 35½ cents per yard, and 35,065 cubic yards of sand and gravel, at a field cost of \$3,909.25, or, approximately, 11¼ cents per yard.

Partially constructing 721 linear feet of jetties, in which were placed 341 piles and a small amount of brush and stone, at a cost of \$1,364.55.

Fitting up plant in quarry and quarrying 336 cubic yards of stone, at a total cost of \$2,158.57.

Snag-boat work, as follows:

Overhanging trees removed.....	2,283
Logs removed from river.....	12
Snags and stumps removed from river.....	526

At a field cost of \$2,727.83.

There was also expended, for repairs and additions to plant, \$11,166.97..

#### RECOMMENDATIONS.

The system of jetties should be further extended downstream toward Eufaula and maintained; dredging should be done in connection with the works of regulation where required, and the river throughout its length should be kept free from snags and similar obstructions.

It is proposed to apply the available funds and the additional appropriation recommended to this work.

*Money statement.*

July 1, 1906, balance unexpended.....	\$25, 112. 28
Amount appropriated by river and harbor act approved March 2, 1907.....	150, 000. 00
Amount allotted by Chief of Engineers November 13, 1906, from appropriation for emergencies act of March 3, 1905.....	10, 000. 00
	<u>185, 112. 28</u>
June 30, 1907, amount expended during fiscal year:	
For works of improvement.....	\$7, 000. 00
For maintenance of improvement.....	26, 457. 66
	<u>33, 457. 66</u>
July 1, 1907, balance unexpended.....	151, 654. 62
July 1, 1907, outstanding liabilities.....	7, 497. 31
	<u>144, 157. 31</u>
Amount that can be profitably expended in fiscal year ending June 30, 1909, in addition to the balance unexpended July 1, 1907:	
For works of improvement.....	\$50, 000. 00
For maintenance of improvement.....	25, 000. 00
	<u>75, 000. 00</u>
Submitted in compliance with requirements of sundry civil act of June 4, 1897, and of section 7 of the river and harbor act of 1899.	

## APPROPRIATIONS.

February 24, 1835.....	\$2, 000. 00
June 23, 1874.....	} 52, 000. 00
March 3, 1875.....	
August 14, 1876.....	
June 18, 1878.....	18, 000. 00
March 3, 1879.....	15, 000. 00
June 4, 1880.....	20, 000. 00
March 3, 1881.....	20, 000. 00
August 2, 1882.....	25, 000. 00
July 5, 1884.....	35, 000. 00
August 5, 1886.....	20, 000. 00
August 11, 1888.....	20, 000. 00
September 19, 1890.....	20, 000. 00
July 13, 1892.....	20, 000. 00
August 18, 1894.....	<sup>b</sup> 25, 000. 00
June 3, 1896.....	<sup>b</sup> 20, 000. 00
March 3, 1899.....	<sup>b</sup> 45, 000. 00
June 13, 1902.....	100, 000. 00
Amount of unexpended balance transferred from appropriation for Chattahoochee River between West Point and Franklin.....	280. 78
April 28, 1904 (allotment).....	32, 650. 00
March 3, 1905.....	75, 000. 00
November 15, 1906 (emergency allotment).....	10, 000. 00
March 2, 1907.....	150, 000. 00
Total .....	<u>724, 930. 78</u>

<sup>a</sup>Allotted from appropriations aggregating \$70,000 for Improving Chattahoochee and Flint rivers.

<sup>b</sup> Does not include \$5,000 for expenditure between West Point and Franklin.

<sup>c</sup> Of this amount, \$2,000 (appropriation of February 24, 1835) was carried to the surplus fund.

## COMMERCIAL STATISTICS.

The commerce interested on this river is chiefly cotton, naval stores, and general merchandise. The river runs through a section of country where there are but few railroads (none parallel with the river), and the people depend largely on the boats for their supplies. There is also a large passenger traffic on the river.

The commercial statistics for the Chattahoochee River are so combined with those of the Flint, Apalachicola, and Chipola rivers that a separation is impracticable, and reference is made to report upon Flint River improvement for detailed statistics.

Columbus, Ga., at the head of navigation, with its magnificent water power, is rapidly becoming one of the greatest manufacturing centers of the South, and with the completion of the deep-water harbor projected at the mouth of this system of rivers the importance of this improvement will be greatly increased.

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Q 6.

## IMPROVEMENT OF CHOCTAWHATCHEE RIVER, FLORIDA AND ALABAMA.

For description, statements of project, and original and present conditions, see Annual Report of the Chief of Engineers for 1907, page 358.

## OPERATIONS DURING THE FISCAL YEAR ENDING JUNE 30, 1907, BETWEEN NEWTON AND GENEVA, ALA.

The snag boat *Choctawhatchee*, belonging to the improvement, was docked and thoroughly repaired, but no channel work was done during the year.

## RECOMMENDATIONS.

The permanent part of the improvement of the section of river between Newton and Geneva is completed, and no further work on it is recommended until the section between Geneva and the mouth of the Holmes River is improved.

Below Geneva, and especially below the mouth of the Holmes River, the river should be kept clear of all obstructions to provide proper facilities for the timber industry and the important commerce on the two rivers, in which five steamers are engaged.

The channel across the bar at Cypress Top should be maintained to afford proper facilities for the tugs engaged in the large lumber trade of the river.

The additional funds recommended for appropriation are for the river below Geneva, and it is proposed to apply them to removing obstructions below this point and to maintaining the channel at Cypress Top.



*Money statements.*

## BETWEEN GENEVA AND NEWTON—GENERAL IMPROVEMENT.

July 1, 1906, balance unexpended.....	\$1, 639. 00
Amount appropriated by river and harbor act approved March 2, 1907.....	10, 000. 00
	<hr/> 11, 639. 00
June 30, 1907, amount expended during fiscal year, for maintenance of improvement.....	1, 939. 38
July 1, 1907, balance unexpended.....	9, 699. 62
July 1, 1907, outstanding liabilities.....	54. 55
July 1, 1907, balance available.....	<hr/> 9, 645. 07
<hr/>	
{ Amount that can be profitably expended in fiscal year ending June 30, 1908, for maintenance of improvement, in addition to the balance unexpended July 1, 1907.....	8, 000. 00
{ Submitted in compliance with requirements of sundry civil act of June 4, 1897, and section 7 of the river and harbor act of 1899.	

## CYPRESS TOP OUTLET.

July 1, 1906, balance unexpended.....	\$663. 94
June 30, 1907, amount expended during fiscal year, for maintenance of improvement.....	663. 94

## APPROPRIATIONS.

March 3, 1833.....	\$5, 000. 00	August 18, 1894.....	\$6, 000. 00
June 15, 1844.....	10, 000. 00	June 3, 1896.....	5, 000. 00
June 25, 1874.....	5, 000. 00	March 3, 1899.....	16, 000. 00
March 3, 1875.....	5, 000. 00	June 13, 1902.....	16, 000. 00
August 4, 1876.....	5, 000. 00	June 13, 1902 (allotment).....	3, 000. 00
March 3, 1879.....	5, 000. 00	March 3, 1905.....	10, 000. 00
June 14, 1880.....	7, 000. 00	March 3, 1905 (allotment).....	2, 000. 00
March 3, 1881.....	10, 000. 00	March 3, 1905 (allotment).....	300. 00
August 2, 1882.....	<sup>a</sup> 18, 000. 00	March 2, 1907.....	10, 000. 00
July 5, 1884.....	15, 000. 00		
August 5, 1886.....	15, 000. 00	Total.....	203, 300. 00
August 11, 1888.....	10, 000. 00	Carried to the surplus fund	
September 19, 1890.....	12, 500. 00	(1852).....	2, 123. 38
July 13, 1892.....	12, 500. 00		

## COMMERCIAL STATISTICS.

The commerce of this stream is mainly saw logs, timber, naval stores, and general merchandise, the value of which for the fiscal year ending June 30, 1907, is estimated to be \$800,000.

<sup>a</sup> Does not include \$2,000 allotted for expenditure on Holmes River.

## Q 7.

## IMPROVEMENT OF HOLMES RIVER, FLORIDA, FROM VERNON TO ITS MOUTH.

For descriptive statement of conditions and project, see Annual Report of the Chief of Engineers for 1907, page 359.

## OPERATIONS DURING THE FISCAL YEAR ENDING JUNE 30, 1907.

No work was done upon this river during the year. As a large and growing commerce has sprung up on this stream between Vernon and Pensacola it should be kept free from obstructions. The funds now available and the appropriation recommended are to be applied to this work.

*Money statement.*

July 1, 1906, balance unexpended-----	\$5. 02
Amount appropriated by river and harbor act approved March 2, 1907--	2, 000. 00
	<hr/>
June 30, 1907, amount expended during fiscal year, for maintenance of improvement -----	2, 005. 02
	5. 02
	<hr/>
July 1, 1907, balance unexpended-----	2, 000. 00
	<hr/>
{ Amount that can be profitably expended in fiscal year ending June 30, 1909, for maintenance of improvement, in addition to the balance unexpended July 1, 1907-----	
{ Submitted in compliance with requirements of sundry civil act of June 4, 1897, and of section 7 of the river and harbor act of 1899.	
	1, 500. 00

## APPROPRIATIONS.

August 2, 1882-----	\$2, 000	March 3, 1905 -----	\$2, 000
August 5, 1886-----	2, 000	March 2, 1907 -----	2, 000
August 11, 1888-----	3, 000		
September 19, 1890-----	3, 000	Total -----	\$16, 000
April 28, 1904 (allotment)-----	2, 000		

## COMMERCIAL STATISTICS.

The commerce of this stream consists of cotton, turpentine, rosin, molasses, honey, and miscellaneous articles, which are carried by water to Pensacola to market, five steamers being engaged in the trade, the value of which in 1907 is estimated at \$800,000.

## Q 8.

## IMPROVEMENT OF BLACKWATER RIVER, FLORIDA.

For description of the locality, its original condition, and the project for improvement, see Annual Report of the Chief of Engineers for 1907, page 360.

<sup>a</sup>Allotted from appropriation of \$20,000 for improving the Choctawhatchee River.

<sup>b</sup>Of this amount there was returned to the Treasury, \$4,839.20, which was reappropriated by act of March 3, 1899.

## OPERATIONS DURING THE FISCAL YEAR ENDING JUNE 30, 1907.

Dredging was commenced in East Bay, near the beacon about 2 miles below Robinson's Point, on January 24, 1907, with the 8-inch suction dredge and plant belonging to the United States and continued till June 26, 1907. As this dredging had been delayed by diversion of plant to emergency work on the Escambia River after the September hurricane, the 10-inch suction dredge *Fidget*, of Pensacola, was leased to expedite matters. She commenced work on May 21 and was employed until June 27 in connection with the Government plant. A channel about 4,470 feet long, from 70 to 80 feet wide, and not less than 9 feet deep at mean low water was dredged from a point near the beacon about 2 miles below Robinson's Point north toward this point, improving the worst shoals between Pensacola and Milton. In executing this work it is estimated that about 30,000 cubic yards, place measurement, was removed.

## RECOMMENDATIONS.

The channel should be completed from Milton to Pensacola Bay as projected and then maintained, and the appropriation recommended is for this work.

*Money statement.*

July 1, 1906, balance unexpended.....	\$8,911. 67
Amount appropriated by river and harbor act approved March 2, 1907.....	5,000. 00
	<hr/> 13,911. 67
June 30, 1907, amount expended during fiscal year:	
For works of improvement.....	\$7,500. 00
For maintenance of improvement.....	2,782. 65
	<hr/> 10,282. 65
July 1, 1907, balance unexpended.....	3,629. 02
July 1, 1907, outstanding liabilities.....	3,120. 08
	<hr/> 508. 94
July 1, 1907, balance available.....	<hr/> 20,000. 00
Amount (estimated) required for completion of existing project.....	<hr/> 20,000. 00
Amount that can be profitably expended in fiscal year ending June 30, 1909, in addition to the balance unexpended July 1, 1907:	
For works of improvement.....	\$20,000. 00
For maintenance of improvement.....	5,000. 00
	<hr/> 25,000. 00
Submitted in compliance with requirements of sundry civil act of June 4, 1897, and of section 7 of the river and harbor act of 1899.	

## APPROPRIATIONS.

March 3, 1899.....	\$5,000
March 3, 1905.....	10,000
March 2, 1907.....	5,000
	<hr/> 20,000
Total.....	20,000

## COMMERCIAL STATISTICS.

The value of timber, lumber, and other manufactured wooden products going out of this river amounts to about \$1,000,000 annually. In addition, the commerce in general merchandise and other products between Pensacola and Milton amounts to about 3,500 tons, valued at \$350,000. There is a dry dock at Bagdad and a marine railway at Milton, to which nearly all of the steamboats and sailing vessels owned at Pensacola come, and more would come if there was sufficient water.

## Q 9.

## IMPROVEMENT OF HARBOR AT PENSACOLA, FLORIDA.

For description of original condition of the improvement, project, and work done, see Annual Report of the Chief of Engineers for 1907, page 361.

## OPERATIONS DURING THE FISCAL YEAR ENDING JUNE 30, 1907.

Dredging in the Caucus channel was continued by the U. S. dredge *Caucus* until September 21, 1906, when trouble with the crowns of her furnaces laid the dredge up for repairs. During the hurricane of September 26-27 many vessels were driven ashore at the Pensacola Navy-Yard, and on October 6 the *Caucus* was loaned to the Navy Department for salvage work. She finished with this work on January 10, and was then laid up for general repairs and annual overhauling. She was docked at the navy-yard on February 26 and launched on the 28th of March, but due to the crippled facilities at the yard she was not in condition to work until May 11, when she resumed dredging with one boiler, using a single dredging pump. At the end of the year the port boiler was not yet in commission, due to defects which developed in the course of the repairs.

The storm above mentioned shoaled the Caucus channel somewhat, narrowing it in some places on the east side, and recent work has been confined to these shoal spots.

During the year there was removed 285,907 cubic yards of material, at a field cost of 7.129 cents per yard. This dredging has restored the channel to a width of 225 feet and depth of 30 feet at mean low water.

The steel ranges erected for marking the channel in connection with the work were repaired after the storm.

Orders were placed for the lumber and machinery for the auxiliary inspection schooner for the district to be constructed at the Pensacola Navy-Yard, but only preliminary work upon her has been done at the navy-yard.

The office at Fort Pickens and the boat house at Fort Barrancas, destroyed by the storm, were rebuilt and a new 30-foot launch was purchased to replace the one lost with the boat house.

## RECOMMENDATIONS.

The dredge *Caucus* should be kept at work continuously until the project has been completed; necessary repairs should be made to keep her in first-class condition, and a full supply of spare parts should

be kept on hand to minimize loss of time from breakdowns; facilities for coaling should be installed at the engineer wharf, Fort Pickens, to reduce loss of time taking fuel; the inspection schooner should be completed, and the necessary surveys and examinations of the improvement be made.

It is proposed to apply the available funds and the additional appropriations recommended to this work.

### Money statement.

July 1, 1906, balance unexpended.....	\$52,804.93
Amount appropriated by river and harbor act approved March 2, 1907.....	100,000.00
Received from salvage work of dredge <i>Caucus</i> .....	9,799.32
Received from Maj. J. C. Sanford.....	3,000.00
	<hr/> 165,604.25
June 30, 1907, amount expended during fiscal year:	
For works of improvement.....	\$10,000.00
For maintenance of improvement.....	50,949.79
	<hr/> 60,949.79
July 1, 1907, balance unexpended.....	104,654.46
July 1, 1907, outstanding liabilities.....	7,208.10
	<hr/> 97,446.36
July 1, 1907, balance available.....	<hr/> 2,747.88
Amount that can be profitably expended in fiscal year ending June 30, 1909, in addition to the balance unexpended July 1, 1907:	
For works of improvement.....	\$75,000.00
For maintenance of improvement.....	25,000.00
	<hr/> 100,000.00
Submitted in compliance with requirements of sundry civil act of June 4, 1897, and of section 7 of the river and harbor act of 1899.	

### APPROPRIATIONS.

June 18, 1878.....	\$20,000.00	March 3, 1899.....	70,000.00
March 3, 1879.....	10,000.00	June 6, 1900 (allotment).....	5,000.00
June 14, 1880.....	40,000.00	June 13, 1902.....	<sup>a</sup> 220,000.00
March 3, 1881.....	20,000.00	August 18, 1902 (allotment).....	956.94
August 2, 1882.....	50,000.00	March 3, 1905.....	100,000.00
July 5, 1884.....	55,000.00	March 2, 1907.....	100,000.00
August 5, 1886.....	20,000.00	Received on account of salvage work by dredge <i>Caucus</i> .....	9,799.32
August 11, 1888.....	35,000.00		
September 19, 1890.....	25,000.00		
July 13, 1892.....	75,000.00		
August 18, 1894.....	100,000.00		
June 3, 1896.....	200,000.00	Total.....	<hr/> 1,155,956.26

### CONTRACT IN FORCE.

With Cary & Co. (Incorporated), of Pensacola, Fla. (emergency), dated December 14, 1906, for 1,250 tons of steam coal f. o. b. U. S. dredge *Caucus*, at Pensacola, Fla.; to be commenced December 19, 1906, and subsequent deliveries upon five days' notice until completed; consideration estimated at \$4,187.50.

<sup>a</sup> Includes \$150,000 appropriated for construction of seagoing dredge and \$26,000 allotted by the Chief of Engineers for the same purpose.

## COMMERCIAL STATISTICS.

The following information has been received from the collector of customs, port of Pensacola, Fla.:

Exports to foreign ports.....	\$20, 229, 414
Exports to coastwise ports (no record).	
Imports from foreign ports.....	618, 363
Duties on imports.....	16, 279
Total .....	20, 864, 056

	Number.	Tons.
Vessels entered from—		
Foreign ports .....	259	441, 466
Coastwise ports .....	114	221, 651
Total.....	373	663, 090
Vessels cleared for—		
Foreign ports .....	300	523, 890
Coastwise ports .....	74	123, 894
Total.....	374	647, 784
Vessels engaged in traffic of the port:		
Steam .....	94	3, 462
Sail.....	33	2, 494
Total.....	127	5, 956

Amount of fees, dues, and duties paid during the year, \$45,701.68.

*Freight carried.*

Articles.	Quantity.	Value.
Cotton.....bales..	173, 860	\$9, 827, 718
Coal.....tons..	56, 588	191, 462
Resin.....barrels..	318, 618	1, 421, 460
Lumber.....feet B. M..	187, 564, 000	4, 326, 739
Turpentine.....gallons..	648, 357	854, 607
Tobacco.....pounds..	9, 990, 876	885, 873
Miscellaneous.....packages..		3, 272, 987
Total.....		19, 810, 746

## Q 10.

## IMPROVEMENT OF ESCAMBIA AND CONECHU RIVERS, FLORIDA AND ALABAMA.

For description of this waterway and statements of condition and project see Annual Report of the Chief of Engineers for 1907, page 363.

The object of the improvement is to keep a channel open suitable for the safe passage of rafts and logs during low stages of the river, and to enable tugs to cross the bar at the river's mouth to handle the raft timber.

The river and harbor act of March 2, 1907, reduced the limits of the improvement, and, in addition to a general appropriation for the entire river, made a special appropriation for the part known as the Conecuh River.

## OPERATIONS DURING THE FISCAL YEAR ENDING JUNE 30, 1907.

*General improvement.*—The snag boat *Escambia* was docked and repaired.

On November 10, 1906, the Secretary of War made an emergency allotment of \$5,000 for the removal of fallen timber and similar obstructions blown into the river by the September hurricane.

Work was commenced on December 4, 1906, with two snag boats, and completed January 14, 1907, after working over a distance of 62 miles. The work performed was as follows:

Overhanging trees removed.....	180
Stumps on bank cut level.....	2
Snags removed from river.....	217
Logs cut up on bank.....	119
Wood cut, cords.....	44
At a field cost of \$2,153.68.	

*Conecuh River.*—Preparatory to actual work on the new project for this section of river, a quarterboat was completed and launched, and a derrick barge was 75 per cent constructed. Work on the project will commence early in the coming fiscal year, and funds on hand are sufficient to complete it.

## RECOMMENDATIONS.

The bar at the mouth of the river should be redredged to permit the entrance of tugs to secure the rafts which they tow to Pensacola, as these rafts now have to be floated out over the bar, involving serious delays and losses. The river below the mouth of Patsaliga Creek should also be kept in good condition for rafting, as the output from this river is very heavy, forming a large proportion of the lumber trade of Pensacola. Funds should be provided for the continuous operation of the snag boat and for the necessary dredging.

*Money statements.*

## GENERAL IMPROVEMENT.

July 1, 1906, balance unexpended.....	\$4, 278. 83
Amount appropriated by river and harbor act approved March 2, 1907.....	15, 000. 00
Amount allotted by emergency act.....	5, 000. 00
	<hr/> 24, 278. 83
June 30, 1907, amount expended during fiscal year, for maintenance of improvement.....	6, 312. 85
July 1, 1907, balance unexpended.....	17, 965. 98
July 1, 1907, outstanding liabilities.....	1, 192. 53
July 1, 1907, balance available.....	<hr/> 16, 773. 45
<hr/>	
{ Amount that can be profitably expended in fiscal year ending June 30, 1908, for maintenance of improvement, in addition to the balance unexpended July 1, 1907.....	8, 000. 00
{ Submitted in compliance with requirements of sundry civil act of June 4, 1897, and of section 7 of the river and harbor act of 1899.	

# 1356 REPORT OF THE CHIEF OF ENGINEERS, U. S. ARMY.

## CONECUH RIVER.

Amount appropriated by river and harbor act approved March 2, 1907	\$31,000.00
June 30, 1907, amount expended during fiscal year, for works of improvement	964.20
July 1, 1907, balance unexpended	30,035.80
July 1, 1907, outstanding liabilities	890.33
July 1, 1907, balance available	29,136.47

## APPROPRIATIONS.

For Escambia River:	
March 2, 1833	\$5,000
July 2, 1836	5,500
June 14, 1880	8,000
March 3, 1881	5,000
July 5, 1884	3,000
	113,500
For Escambia and Conecuh rivers:	
August 2, 1882	12,000
July 5, 1884	12,000
August 5, 1886	12,000
August 11, 1888	10,000
September 19, 1890	7,500
July 13, 1892	8,000
August 18, 1894	6,000
June 3, 1896	4,000
March 3, 1899	5,000
June 6, 1900 (allotment from emergency act)	1,500
June 13, 1902	5,000
March 3, 1905	10,000
November 10, 1906 (allotment from emergency act)	5,000
March 2, 1907	15,000
	113,000
For Conecuh River:	
March 2, 1907	31,000
	170,500
Carried to the surplus fund (1838)	5,500
Balance	165,000

## COMMERCIAL STATISTICS.

The commerce of this stream is mainly timber, lumber, saw logs, of which the value for the fiscal year is reported at \$2,500,000.



## Q II.

## IMPROVEMENT OF ALABAMA RIVER, ALABAMA.

For descriptions, statements of past and present conditions, and projects, see Annual Report of the Chief of Engineers for 1907, page 365.

References to previous operations upon this river will be found in Annual Report of the Chief of Engineers for 1906, page 1259.

## OPERATIONS DURING THE FISCAL YEAR ENDING JUNE 30, 1907.

The river was uniformly high throughout the year, and very little field work could be done. The snag boat *Wm. J. Twining* was employed in tending the dipper dredge and in snagging operations, the following obstructions being removed from the river:

Overhanging trees removed.....	273
Stumps and logs removed from bank.....	42
Snags removed from river.....	10
Deadheads removed from river.....	4

Due to high water the dipper dredge was able to work very little during the season. Her operations were confined to Upper Gause's bar, where she removed 8,750 cubic yards. At the end of the year she was put in commission for the coming season, and towed to Silver Creek shoals in the lower river, where she commenced work on June 29.

A jetty 240 feet long was constructed at Upper Gause's bar to hold the channel in the dredged cut, and a jetty partially constructed at Lower Gause's bar for the same purpose.

The hull of the dipper dredge was practically rebuilt, and minor repairs, principally calking and painting, were made to the towboat *Alabama*, the snag boat *Wm. J. Twining*, and other plant belonging to the improvement.

The snag boat *Wm. J. Twining* was taken to Mobile to receive a set of new boilers nearing completion under contract dated January 29, 1907. The old boilers have been removed and the boat tied up waiting for the new installation.

A light-draft inspection launch was purchased, and contract entered into for the construction of four creosoted barges. These barges are now nearing completion at Mobile.

## RECOMMENDATIONS.

Snagging operations should be continued. Channels should be dredged across those shoals which obstruct navigation, and these channels should be secured by works of regulation. Those old works of regulation found to be properly located should be repaired or rebuilt, as may be required. As far as practicable, work should be carried on from the mouth of the river upstream. The most troublesome obstructions at present are Jewetts bar, Silver Creek shoals, Haines Island, Steins Island, Hobbs Island, Evans lower bar, McGuire's bar, Mary Taylors bar, first bar above Selma, and Gardners Island, and it is expected that some work will be done upon all of these during the coming season.

*Money statement.*

July 1, 1906, balance unexpended.....	\$61, 626. 50
Amount appropriated by river and harbor act approved March 2, 1907..	200, 000. 00
	<hr/> 261, 626. 50
June 30, 1907, amount expended during fiscal year :	
For works of improvement.....	\$5, 000. 00
For maintenance of improvement.....	28, 285. 56
	<hr/> 31, 285. 56
July 1, 1907, balance unexpended.....	230, 340. 94
July 1, 1907, outstanding liabilities.....	18, 954. 03
	<hr/> 211, 386. 91
July 1, 1907, balance available.....	<hr/> 211, 386. 91
July 1, 1907, amount covered by uncompleted contracts.....	15, 710. 00
	<hr/> <hr/>
Amount that can be profitably expended in fiscal year ending June 30, 1909, in addition to the balance unexpended July 1, 1907 :	
For works of improvement.....	\$75, 000. 00
For maintenance of improvement.....	25, 000. 00
	<hr/> 100, 000. 00
Submitted in compliance with requirements of sundry civil act of June 4, 1897, and of section 7 of the river and harbor act of 1899.	

## APPROPRIATIONS.

June 18, 1878.....	\$25, 000	August 18, 1894.....	\$50, 000
March 3, 1879.....	30, 000	June 3, 1896.....	40, 000
June 14, 1880.....	25, 000	March 3, 1899.....	50, 000
March 3, 1881.....	20, 000	June 13, 1902.....	20, 000
August 2, 1882.....	20, 000	June 13, 1902 (allotment)....	4, 000
July 5, 1884.....	10, 000	March 3, 1905.....	100, 000
August 5, 1886.....	15, 000	March 2, 1907.....	200, 000
August 11, 1888.....	20, 000		
September 19, 1890.....	20, 000	Total.....	719, 000
July 13, 1892.....	70, 000		

## CONTRACTS IN FORCE.

With Gulf City Boiler Works Company, of Mobile, Ala. (emergency), dated January 29, 1907, for furnishing and installing two boilers and fixtures on U. S. snag boat *Wm. J. Twining*; to be commenced February 8, 1907, and be completed within one hundred and ten days thereafter; consideration estimated at \$3,810.

With Gulf Dry Dock Company, of Mobile, Ala. (formal), dated April 13, 1907, for constructing four wooden barges; to be commenced ten days after notification of approval of contract and be completed within one hundred and sixteen days thereafter; consideration estimated at \$11,900.

## COMMERCIAL STATISTICS.

The commerce of this stream is important, consisting principally of cotton, cotton seed, fertilizers, grain, lumber, shingles, naval stores, staves, and a large

quantity of miscellaneous freight of all descriptions, estimated for the past fiscal year at 133,721 tons, valued at \$8,958,632.

Very large quantities of sawn and hewn timber, saw logs, cord wood, etc., consisting of yellow pine, sycamore, cottonwood, poplar, and ash, are barged and rafted down this stream to Mobile. The total amount of this commerce from the Alabama, Tombigbee, and Mobile rivers is reported at 708,304 tons, valued at \$4,687,139, of which it is estimated that 40 per cent comes from the Alabama River.

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### Q 12.

#### IMPROVEMENT OF COOSA, OOSTENLAULA, AND COOSAWATTEE RIVERS, GEORGIA AND ALABAMA.

For description of these rivers and statements of past and present conditions and project, see Annual Report of the Chief of Engineers for 1907, page 366.

#### OPERATIONS DURING THE FISCAL YEAR ENDING JUNE 30, 1907.

##### (A) COOSA RIVER BETWEEN ROME AND THE EAST TENNESSEE, VIRGINIA AND GEORGIA RAILROAD BRIDGE.

Operations during the year have been confined to the improvement and maintenance of that part of the river between Rome, Ga., and Lock 4, Alabama, but as the river was abnormally high very little was accomplished.

Dredging was commenced at Double Islands on July 2, 1906, but was suspended for the season on September 29, 1906, on account of high water, which had already caused frequent interruption in the work. About 7,000 cubic yards of sand and gravel were removed at Double Islands, at a cost of about 6 cents per yard, and about 3,000 yards at Croft's shoals, at a cost which had nearly reached 30 cents per yard on account of interruptions when work was finally suspended.

The towboat *Leota* started for Croft's shoals on August 27, 1906, with the construction gang to begin work of building dams, but when operations had been suspended for the season the river had been down to a suitable working stage for only three days; there was built 100 lineal feet of dam, 6 feet wide, averaging 9.25 feet in height, and containing 206 cubic yards of stone. For the greater part of the time, however, the work of this force was confined to quarrying stone at Croft's ferry.

The plant and other property belonging to the improvement were cared for, and at the end of the fiscal year the plant was overhauled and repaired, in readiness for the coming season's work.

#### RECOMMENDATIONS.

It is recommended that a channel for 4-foot navigation be secured and maintained between Rome, Ga., and Lock 4, Alabama, and for this work that an additional dredge and 2 additional barges be constructed.

Since Congress has recently authorized the completion of the dam and fore bay at Lock 4 by private interests, no estimate for this work is submitted; but unless it is completed in the near future the work should be undertaken by the United States, as the old cofferdam now serving as the east abutment is in such bad condition as to endanger the safety of the dam.

It is proposed to apply the available funds to improving the channel between Rome, Ga., and Lock 4, as provided in the act of March 3, 1905, and to apply the additional appropriation recommended to the construction of additional plant and the further improvement and maintenance of the channel between Rome, Ga., and Lock 4, Alabama.

## APPROPRIATIONS.

August 14, 1876 -----	\$30,000.00	Received from sales of	
June 18, 1877 -----	75,000.00	property -----	\$1,448.05
March 3, 1879 -----	45,000.00	June 13, 1902 (allot-	
July 14, 1880 -----	75,000.00	ment) -----	7,500.00
March 5, 1881 -----	60,000.00	March 3, 1905 -----	25,000.00
August 2, 1882 -----	83,700.00	March 2, 1907 -----	*48,000.00
July 5, 1884 -----	50,000.00		
August 5, 1886 -----	45,000.00		1,110,648.05
August 11, 1888 -----	60,000.00	Less amount transferred	
September 19, 1890 -----	150,000.00	by act of June 13, 1902,	
July 13, 1892 -----	130,000.00	to the Oostenaula and	
August 18, 1894 -----	110,000.00	Coosawattee rivers -----	7,155.80
June 3, 1896 -----	50,000.00		
March 3, 1899 -----	20,000.00	Total -----	1,103,492.25
June 13, 1902 -----	35,000.00		
June 13, 1902, amount			
made available from			
lower division of the			
river -----	10,000.00		

## COMMERCIAL STATISTICS.

[Furnished by the Oostenaula and Coosa River Steamboat Co.; the Georgia and Alabama Steamboat Co.; Patton Sash, Door and Building Co.; Trammell & Son; N. G. Watson, of Rome, Ga.; D. H. Johnson, owner of the steamer *City of Gadsden*; Kyle Lumber Co.; Southern Manufacturing Co.; F. M. McCoy and Collins Bros., of Gadsden, Ala.; Lathrop-Hatten Lumber Co., of Riverside, Ala.]

Stern-wheel steam-boats.	Regis-tered tonnage.	Draft.		Between—	Passen-gers.
		Light.	Loaded.		
		Inches.	Feet.		
Alabama .....	137	18	5	Rome, Ga., and Lock 4.....	600
Dixie .....	72	14	3½	.....do .....	500
Willie C. Wagon .....	151	22	4	Rome, Ga., and Gadsden, Ala.....	None.
City of Gadsden.....	14			.....do .....	None.

\* Does not include \$2,000 allotted for expenditure at Wetumpka, Ala.

*Freight carried.*

Articles.	Quantity.	Tons.
Cotton.....	bales 11,500	2,875
Cotton seed.....	sacks 28,800	2,108
Cotton-seed meal.....	do. 12,000	600
Fertilizers.....	do. 28,280	3,030
Oats.....	do. 2,000	160
Corn.....	do. 3,400	208
Hay.....	bales 3,300	202
Timber.....	feet B. M. 22,107,700	75,600
Railroad cross-ties.....	number 99,000	10,643
Building and furnace sand.....	.....	16,500
Flour.....	barrels 7,600	745
Sugar.....	do. 1,300	260
Molasses.....	do. 325	96
Bagging.....	rolls 1,950	759
Ties.....	bundles 2,460	66
General miscellaneous.....	packages 24,760	879
Hides and skins.....	do. 500	12
Live stock.....	head 580	278
Lumber.....	feet B. M. 2,160,000	6,385
Staves.....	pieces 200,000	600
Provisions (case goods).....	packages 32,000	770
Coffee.....	sacks 550	24
Corn meal.....	do. 3,350	78
Bacon, smoked and dry salted.....	boxes 4,600	203
Salt.....	sacks 2,120	135
Lard.....	packages 580	15
Soap.....	boxes 1,100	27
Nails.....	kegs 1,090	55
Shingles.....	number 292,000	145
Barytes.....	.....	520
Brick.....	number 168,000	105
Total.....	.....	124,078

Estimated value of above freights (in round numbers), \$3,500,000.

(B) COOSA RIVER BETWEEN WETUMPKA AND EAST TENNESSEE, VIRGINIA  
AND GEORGIA RAILROAD BRIDGE.

OPERATIONS DURING THE FISCAL YEAR ENDING JUNE 30, 1907.

The property belonging to the improvement was properly cared for and such slight repairs were made to the lock house, fences, cement warehouse, and general storage sheds as were found necessary and funds available permitted.

RECOMMENDATIONS.

The buildings at Lock 31 are deteriorating rapidly for want of proper repairs, and the property stored in them needs proper attention and care. There will be required for these repairs \$2,000, which should be provided. At present no other work is recommended, pending a decision as to the character and extent of the further improvement of the Coosa River. Should a new project for securing 6-foot navigation in the Coosa and Alabama rivers be adopted, funds should be made available for examination of lock sites, borings for foundations, discharge measurements, gauge observations, and other necessary work preliminary to actual construction.

It is proposed to apply the additional appropriation recommended to the care and preservation of property at Lock 31.

## APPROPRIATIONS.

September 19, 1890.....	\$150,000.00
July 13, 1892.....	100,000.00
August 18, 1894.....	110,000.00
June 3, 1896.....	50,000.00
Amount received from sale of Government property.....	423.32
March 2, 1907.....	a 2,000.00
	<hr/>
	412,423.32
Less amount transferred by act of June 13, 1902, to upper division of the river.....	10,000.00
	<hr/>
Total.....	402,423.32

## COMMERCIAL STATISTICS.

On this part of the Coosa River there is a small commerce in the rafting of logs and square timber, but this can be carried on only during the season when the river is about 12 feet above low water, and no reliable estimate of its value can be obtained.

## (C) OOSTENLAULA AND COOSAWATTEE RIVERS, GEORGIA.

For description, statements of past and present conditions, and project, see Annual Report of the Chief of Engineers for 1906, page 353.

For reference to descriptions of previous operations upon these rivers, see Annual Report of the Chief of Engineers for 1905, page 328.

## OPERATIONS DURING THE FISCAL YEAR ENDING JUNE 30, 1907.

Nothing was done during the fiscal year.

As the commercial benefits to be derived from the improvement of these rivers are very small, and any further improvement at present of doubtful value, no further appropriations are recommended until the fixed bridges obstructing the rivers are modified. Should any future appropriations be made, they should provide for the construction and operation of a suitable plant, consisting of one small light-draft snag boat and two light-draft barges, which could be utilized on the upper Coosa River also, for no suitable plant can be hired and rentals for plant obtainable are exorbitant.

Estimate for this plant and operation for one year is as follows:

Construction of light-draft snag boat.....	\$8,000
Construction of two barges.....	3,000
Operation of plant.....	9,000
	<hr/>
Total .....	20,000

aAllotted from appropriation of \$50,000 for improving Coosa River.

## APPROPRIATIONS.

1874.....	\$10,000.00	Transferred by act of	
1875.....	5,000.00	June 13, 1902, from	
1878.....	4,000.00	Coosa, Oostenaula, and	
1879.....	3,000.00	Coosawattee rivers	
1880.....	2,000.00	(Rome division).....	\$7,155.80
1881.....	1,000.00		
1882.....	1,000.00	Total.....	\$33,155.80

## COMMERCIAL STATISTICS.

No commerce reported on these streams, though light-draft boats make occasional trips from Rome, Ga., to Carters Landing, at the head of navigation on the Coosawattee River, when the stage of the river permits their passage under the numerous low bridges over these streams.

*Money statement.*

## CONSOLIDATED.

July 1, 1906, balance unexpended.....	\$14,570.92
Amount appropriated by river and harbor act approved March 2, 1907.....	50,000.00
Amount received from sale of typewriter.....	5.00
	<u>64,575.92</u>
June 30, 1907, amount expended during fiscal year, for maintenance of improvement.....	7,521.83
July 1, 1907, balance unexpended.....	57,054.09
July 1, 1907, outstanding liabilities.....	2,297.61
July 1, 1907, balance available.....	<u>54,756.48</u>
Amount (estimated) required for completion of existing project..	<u>6,059,913.00</u>
<div style="display: flex; align-items: center;"> <div style="font-size: 3em; margin-right: 10px;">{</div> <div>           Amount that can be profitably expended in fiscal year ending June 30, 1909, in addition to the balance unexpended July 1, 1907:                For works of improvement..... \$75,000.00                For maintenance of improvement..... 25,000.00  <div style="border-top: 1px solid black; margin-top: 5px;">100,000.00</div> </div> </div>	
<div style="display: flex; align-items: center;"> <div style="font-size: 3em; margin-right: 10px;">{</div> <div>           Submitted in compliance with requirements of sundry civil act of June 4, 1897, and of section 7 of the river and harbor act of 1899.         </div> </div>	

## Q 13.

## OPERATION AND CARE OF CANALS AND OTHER WORKS OF NAVIGATION ON COOSA RIVER, GEORGIA AND ALABAMA.

During the fiscal year ending June 30, 1907, the locks were operated without interruption.

<sup>a</sup> Oostenaula River.

<sup>b</sup> In 1897, \$499.39 covered into the surplus fund.

Allotments to the amount of \$20,300 were made for the fiscal year ending June 30, 1907, for the following purposes:

Salaries of lock keepers.....	\$1,800
Dredging entrances to Locks 1, 2, and 3.....	1,500
Repairs to break in Dam 2.....	2,000
Strengthening Dam 4.....	6,000
For two barges, to be built of creosoted lumber.....	9,000
Total.....	20,300

All work provided for was done, with the exception of the construction of the barges. Under contract with the Gulfport Creosoting Company these barges were framed and about one-fourth of the material creosoted and delivered at Lock 3.

Summary of expenditures made during the fiscal year ending June 30, 1907, at Locks 1, 2, and 3, and Dam 4, and upon construction of barges:

Services.....	\$9,533.54
Material and supplies.....	402.84
Provisions.....	1,193.55
Fuel.....	171.07
Telegrams and notarial fees.....	2.24
Traveling expenses.....	127.62
Ferry tolls.....	2.25
Advertising.....	11.00
Total.....	11,444.11

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#### CONTRACT IN FORCE.

With Gulfport Creosoting Company, of Gulfport, Miss. (emergency), dated January 28, 1907, for framing, creosoting, and delivering lumber for two wooden barges at Lock 3, Alabama; to be commenced February 7, 1907, and be completed within one hundred and thirty-five days thereafter; consideration estimated at \$6,985.



## APPENDIX R.

### IMPROVEMENT OF RIVERS AND HARBORS IN WESTERN ALABAMA AND EASTERN MISSISSIPPI.

REPORT OF MAJ. H. JERVEY, CORPS OF ENGINEERS, OFFICER IN  
CHARGE, FOR THE FISCAL YEAR ENDING JUNE 30, 1907.

#### IMPROVEMENTS.

- |   |   |
|---|---|
| 1. Harbor at Mobile, Alabama.   | 8. Harbor at Biloxi, Mississippi.   |
| 2. Mobile bar, Alabama.   | 9. Channel from Gulfport to Ship Island Harbor, Mississippi.                |
| 3. Black Warrior, Warrior, and Tombigbee rivers, Alabama and Mississippi. | 10. Wolf and Jordan rivers, Mississippi.                                    |
| 4. Operating and care of locks and dams on Black Warrior River, Alabama.  | 11. Pearl River below Rockport, Mississippi.                                |
| 5. Pascagoula River, Mississippi.   | 12. Pearl River between Edinburg and Jackson, Mississippi.                  |
| 6. Pascagoula, Leaf, and Chickashay rivers, Mississippi.                  | 13. Removing sunken vessels or craft obstructing or endangering navigation. |
| 7. Horn Island Pass, Mississippi.   |   |

UNITED STATES ENGINEER OFFICE,  
*Mobile, Ala., July 6, 1907.*

GENERAL: I have the honor to forward herewith annual report for the fiscal year ending June 30, 1907, for the works of rivers and harbors under my charge.

Very respectfully, your obedient servant,

H. JERVEY,  
*Major, Corps of Engineers.*

Brig. Gen. A. MACKENZIE,  
*Chief of Engineers, U. S. A.*

#### R I.

#### IMPROVEMENT OF HARBOR AT MOBILE, ALABAMA.

Accounts of the earlier improvement of this locality are contained in the Annual Reports of the Chief of Engineers for 1896, page 1425; 1900, page 2161; and 1903, page 1237.

During the past fiscal year expenditures have been applied to the following operations:

(1) THE MAINTENANCE OF A 23-FOOT CHANNEL IN MOBILE HARBOR.

The last contract for dredging work in the formation of the projected 23-foot channel was completed November 11, 1903, since which time all work has been the removal of shoals formed in channel.

Under a contract with George G. Barker, of Wilmington, Del., dated October 13, 1906, dredging began on November 13, 1906, and continued until April 15, 1907. During this time 1,109,410 cubic yards of material, scow measurement, were removed from the channel between a point 600 feet north of Light-House Beacon 14 and a point 4,188 feet south of the same beacon, and between a point 2,840 feet north of Light-House Beacon 8A and a point 1,056 feet south of Light-House Beacon 4, restoring a depth of 23 feet for a width of about 50 feet at bottom.

The total amount expended during the past fiscal year for the above work and contingent expenses was \$101,807.56.

(2) THE REMOVAL OF SUNKEN LOGS AND SIMILAR OBSTRUCTIONS FROM THE CHANNEL IN MOBILE HARBOR.

A few of the worst obstructions have been removed from the navigable channel from time to time. The snag boat *Demopolis* has been overhauled, some repairs made, and is now preparing for work under the new appropriation. The amount expended during the past fiscal year for the above work was \$261.84.

*Money statements.*

GENERAL IMPROVEMENT.

July 1, 1906, balance unexpended.....	\$102, 362. 55
June 30, 1907, sale of Government property.....	75. 00
Amount appropriated by river and harbor act approved March 2, 1907.....	190, 000. 00
June 30, 1907, refundment of overpayment.....	.. 37
	<hr/>
June 30, 1907, amount expended during fiscal year, for maintenance of improvement.....	292, 437. 92
	<hr/>
July 1, 1907, balance unexpended.....	190, 630. 36
July 1, 1907, outstanding liabilities.....	1, 630. 00
	<hr/>
July 1, 1907, balance available.....	189, 000. 36
Amount (estimated) required for completion of existing project....	360, 000. 00
	<hr/>
<div style="display: flex; align-items: center;"> <div style="font-size: 3em; margin-right: 10px;">{</div> <div> <p>Amount that can be profitably expended in fiscal year ending June 30, 1909, in addition to the balance unexpended July 1, 1907:</p> <p>For works of improvement..... \$360, 000. 00</p> <p>For maintenance of improvement..... 100, 000. 00</p> <p><hr/></p> <p>460, 000. 00</p> </div> </div>	
Submitted in compliance with requirements of sundry civil act of June 4, 1897, and of section 7 of the river and harbor act of 1899.	

## REMOVING OBSTRUCTIONS.

July 1, 1906, balance unexpended.....	\$148. 14
Amount appropriated by river and harbor act approved March 2, 1907.....	10, 000. 00
	<hr/> 10, 148. 14
June 30, 1907, amount expended during fiscal year, for maintenance of improvement.....	261. 84
July 1, 1907, balance unexpended.....	9, 886. 30
July 1, 1907, outstanding liabilities.....	80. 00
July 1, 1907, balance available.....	<hr/> 9, 806. 30
<hr/>	
{ Amount that can be profitably expended in fiscal year ending June 30, 1909, for maintenance of improvement, in addition to the balance unexpended July 1, 1907.....	12, 000. 00
{ Submitted in compliance with requirements of sundry civil act of June 4, 1897, and of section 7 of the river and harbor act of 1899.	

## APPROPRIATIONS.

May 20, 1826.....	\$10, 000. 00
March 2, 1829.....	20, 000. 00
June 24, 1834.....	10, 000. 00
March 3, 1835.....	17, 997. 60
March 3, 1837.....	50, 000. 00
July 7, 1838.....	50, 000. 00
August 3, 1852.....	50, 000. 00
	<hr/> \$207, 997. 60
March 3, 1857 (relief claim).....	20, 833. 00
July 11, 1870.....	50, 000. 00
March 3, 1871.....	50, 000. 00
June 10, 1872.....	75, 000. 00
March 3, 1873.....	100, 000. 00
June 23, 1874.....	100, 000. 00
March 3, 1875.....	26, 000. 00
	<hr/> 401, 000. 00
June 18, 1878 (survey).....	10, 000. 00
March 3, 1879.....	100, 000. 00
June 14, 1880.....	125, 000. 00
March 3, 1881.....	100, 000. 00
August 2, 1882.....	125, 000. 00
July 3, 1884.....	200, 000. 00
August 6, 1886.....	90, 000. 00
	<hr/> 750, 000. 00
August 11, 1888.....	250, 000. 00
September 19, 1890.....	350, 000. 00
July 13, 1892.....	212, 500. 00
March 3, 1893.....	500, 000. 00
August 18, 1894.....	390, 000. 00
March 2, 1895.....	291, 300. 00
March 16, 1896.....	160, 000. 00
June 3, 1896 (maintenance).....	60, 000. 00
June 4, 1897 (maintenance).....	25, 000. 00
July 1, 1898 (maintenance).....	30, 000. 00
	<hr/> 2, 268, 800. 00
March 3, 1899.....	100, 000. 00
June 6, 1900.....	500, 000. 00
June 13, 1902.....	250, 000. 00
March 3, 1903.....	200, 000. 00
March 3, 1905.....	200, 000. 00
March 2, 1907.....	200, 000. 00
	<hr/> 1, 450, 000. 00
April 28, 1904 (maintenance allotment).....	50, 000. 00
June 30, 1907, from sales of Government property.....	1, 100. 50
June 30, 1907, from refundment of overpayment.....	37
Total.....	<hr/> 5, 149, 731. 47

## CONTRACTS IN FORCE.

With George G. Barker, dated October 13, 1906, approved by the Chief of Engineers November 9, 1906, for dredging in Mobile Harbor, Alabama, at the rate of 8 cents per cubic yard for material removed by clam-shell dredge, measured in scows. Work was commenced November 13, 1906, and was completed April 15, 1907.

## COMMERCIAL STATISTICS.

[Statistics furnished by the United States custom-house, Mobile, Ala., showing the business of the port for the calendar year ending December 31, 1906.]

Exports .....	\$22, 378, 890. 00
Imports (valuation at point of shipment) .....	3, 534, 338. 00
Total .....	25, 913, 228. 00
Customs receipts from all sources .....	101, 755. 83

*Vessels entered and cleared, 1906.*

Trade.	Entered.		Cleared.	
	Number.	Tons. <sup>a</sup>	Number.	Tons. <sup>a</sup>
Foreign .....	815	648, 902	783	666, 966
Coastwise .....	160	232, 143	180	214, 190
Total .....	975	881, 045	963	881, 156

<sup>a</sup> Registered net tons.

*Foreign commerce.*

The following statement concerning the foreign commerce of the port of Mobile, Ala., for the calendar year ending December 31, 1906, has been compiled from the records of the United States custom-house:

## EXPORTS.

Articles.	Tons.	Value.	Articles.	Tons.	Value.
Breadstuffs .....	96, 152	\$2, 768, 823	Manufactured goods.....	117, 451	\$1, 407, 418
Coal and coke.....	17, 784	59, 357	Live stock .....	1, 978	291, 226
Cotton and cotton products .....	40, 700	8, 709, 854	Naval stores .....	26, 000	157, 471
Hog products.....	12, 699	1, 955, 870	Staves.....	25, 718	163, 906
Lumber .....	362, 329	3, 415, 484	Miscellaneous.....	64, 760	777, 122
Timber .....	191, 432	2, 672, 363	Total .....	966, 948	22, 378, 894

## IMPORTS.

Articles.	Tons.	Value.	Articles.	Tons.	Value.
Asphalt .....	2, 541	\$10, 400	Sulphur ore.....	16, 796	\$32, 923
Bananas.....	55, 186	1, 379, 665	Crocoate oil .....	4, 637	45, 371
Cocoanuts .....	2, 946	97, 312	Miscellaneous .....	14, 515	319, 326
Sisal grass .....	9, 701	1, 505, 346	Total .....	114, 392	\$3, 534, 338
Hard wood .....	8, 170	143, 995			

<sup>a</sup> Valuation at point of receipt.

Bunker coal furnished outward-bound steamships, 317,693 tons, valued at \$1,013,793.

The following lines of steamships operate between Mobile and foreign ports: United Fruit Company, Central American ports; Orr-Laubenhelmer Steamship

Company, Central American ports; Camors-McConnell Steamship Company, Central American ports; John B. Cefalu & Co., Central American ports; Hubbard-Zemurray Steamship Company, Central American ports; Atlantic and Mexican Gulf Steamship Company, Mexican ports; Benemelis Line, Mexican ports; Markley-Miller Steamship Company, Mexican ports; Munson Line, Cuban ports; Elder Dempster Company, United Kingdom and Continent.

The following lines of steamships operate between Mobile and coastwise ports: Mallory Line, Brunswick, Ga., and New York; Pensacola, St. Andrews and Gulf Steamship Company, Florida ports; Thurman Transportation Company, Florida ports; Mobile and Gulf Steamship Company, Florida ports.

*Coastwise commerce for the calendar year 1906.*

ARRIVING.

Articles.	Tons.	Value.	Articles.	Tons.	Value.
Phosphate.....	3,092	\$30,200.00	Cross-ties.....	169	\$1,500.00
Anthracite coal.....	5,566	30,248.00	Naval stores.....	6,514	201,205.30
Fish and oysters.....	6,470	822,560.00	Logs.....	400	3,900.00
Cement.....	5,579	51,168.75	Miscellaneous.....	40,140	4,541,740.20
Gravel.....	8,000	8,000.00	Total.....	139,319	6,266,401.27
Cord wood.....	4,100	18,900.00			
Lumber and timber.....	59,099	561,979.00			

DEPARTING.

Cotton.....	19,413	\$4,173,198.44	Hay and grain.....	12,270	\$308,385.18
Lumber and timber.....	88,093	978,800.00	Cross-ties.....	1,224	13,600.00
Coal.....	660	2,112.50	Miscellaneous.....	20,268	1,836,098.00
Gravel.....	16,000	18,600.00	Total.....	182,406	7,590,478.62
Cedar strips.....	2,025	140,000.00			
Naval stores.....	2,463	124,684.50			

In addition to the above, water shipments to and from Alabama and Tombigbee river points, consisting of cotton, cotton seed, logs, provisions, feed, machinery, farm supplies, and manufactured goods, amounted in 1906 to 902,805 tons, valued at \$18,022,993.23.

*Comparative statement of the number and draft of vessels passing up and down the dredged channel for the calendar years ending December 31, 1905 and 1906.*

[Compiled from the books of the harbor master at Mobile, Ala.]

Draft.	Steamships.				Square-rigged ves-				Schooners.				Total.			
	Up.		Down.		Up.		Down.		Up.		Down.		Up.		Down.	
	1905.	1906.	1905.	1906.	1905.	1906.	1905.	1906.	1905.	1906.	1905.	1906.	1905.	1906.	1905.	1906.
Less than 13 feet.....	482	482	295	310	89	89	4	2	82	191	206	65	676	692	381	377
13 to 14 feet.....	109	140	183	117	12	14	8	2	82	3	3	53	124	157	118	172
14 to 15 feet.....	72	85	76	46	5	3	2	8	34	2	2	29	79	40	112	78
15 to 16 feet.....	94	69	44	44	4	2	5	10	35	1	4	17	108	72	84	71
16 to 17 feet.....	23	12	42	41	1	2	7	9	16	1	4	11	81	15	65	61
17 to 18 feet.....	23	9	56	28	2	1	4	3	9	4	2	6	25	14	69	37
18 to 19 feet.....	20	7	42	89	2	1	7	8	7	2	2	7	22	10	56	54
19 to 20 feet.....	6	8	35	37	1	2	8	7	6	.....	2	10	8	5	49	54
20 to 21 feet.....	3	8	48	43	.....	1	12	17	1	.....	.....	4	4	4	61	64
21 to 22 feet.....	2	.....	40	29	.....	1	7	4	2	.....	.....	1	2	1	49	34
22 to 23 feet.....	.....	.....	23	6	.....	.....	7	1	.....	.....	.....	.....	.....	.....	80	8
Total.....	784	740	784	740	66	66	66	66	224	204	224	204	1,074	1,010	1,074	1,010

## R 2.

## IMPROVEMENT OF MOBILE BAR, ALABAMA.

At the beginning of the past fiscal year there existed a channel through the outer bar 27 to 30 feet deep, with a width of 250 to 275 feet.

No work has been done during the past fiscal year. The storm of September, 1906, changed the configuration of the bottom at the entrance to Mobile Bay, but seems not to have affected materially the depth of the dredged channel. A recent examination indicates that there is a width of about 225 feet, with a depth of at least 27½ feet throughout the entire length of the channel, but a maximum low-water draft of 28 or 28½ feet could be carried through it.

With available funds, it is proposed to use the seagoing hydraulic dredge *Charleston*, now in this district, to maintain the existing channel and deepen it to 30 feet throughout the projected width of 300 feet.

For commercial statistics, see report on Mobile Harbor, Alabama, foreign and coastwise commerce.

*Money statement.*

July 1, 1906, balance unexpended.....	\$3,542. 80
Amount appropriated by river and harbor act approved March 2, 1907.....	50,000. 00
	<hr/> 53,542. 80
June 30, 1907, amount expended during fiscal year, for works of improvement.....	623. 45
	<hr/> 52,919. 35
July 1, 1907, balance unexpended.....	
<hr/>	
Amount that can be profitably expended in fiscal year ending June 30, 1908, for maintenance of improvement, in addition to the balance unexpended July 1, 1907.....	25,000. 00
{ Submitted in compliance with requirements of sundry civil act of June 4, 1897, and of section 7 of the river and harbor act of 1899.	

## APPROPRIATIONS.

June 13, 1902.....	\$50,000
March 3, 1905.....	50,000
March 2, 1907.....	50,000
	<hr/>
Total.....	150,000

## R 3.

## IMPROVEMENT OF BLACK WARRIOR, WARRIOR, AND TOMBIGBEE RIVERS, ALABAMA AND MISSISSIPPI.

## PROJECT FOR BLACK WARRIOR, WARRIOR, AND TOMBIGBEE RIVERS, ALABAMA.

## (A) BLACK WARRIOR RIVER (ABOVE TUSCALOOSA, ALA.).

## PRESENT CONDITION OF WORK.

Four locks (10, 11, 12, and 13) completed and opened for traffic. Six locks not yet begun. Survey for two of these locks (14 and 15)

has been completed, plans and specifications prepared, sites purchased, and deeds for same delivered to the Department of Justice for examination. Proposal for the construction of these locks can be asked for as soon as titles to land are approved.

Party has been organized for survey of four remaining lock sites, and is now in the field making location survey and foundation borings at the site of Lock 16.

#### NAVIGATION AND COMMERCE.

The bulk of the traffic on this part of the river passes through Locks 10, 11, 12, and 13, and is given in detail in the report on operating and care of Locks and Dams, Black Warrior River, Alabama. In addition to this there is a small traffic in coal on the pool between Locks 12 and 13, statistics of which are not available.

#### (B) WARRIOR RIVER (BELOW TUSCALOOSA, ALA.).

#### PRESENT CONDITION OF WORK.

Three locks (7, 8, and 9) are completed and in operation, and the other three locks, begun under continuing contract, are now under construction with hired labor. The last three locks are about 85 per cent completed.

#### WORK OF THE PAST YEAR.

During the past fiscal year the work of construction at Locks 1, 2, and 3 has been carried on whenever the stage of river would permit, and the high-water season utilized as far as possible for the delivery of supplies and materials at lock sites by barges. The work of construction has been seriously delayed by an unusual amount of high water.

During the fiscal year the following work was accomplished by hired labor:

Material.	Quantity.	Lock 1.	Lock 2.	Lock 3.
Excavated material .....	Cubic yards .....	30,083	26,376	35,082
Concrete .....	do .....	2,801	8,191	2,530
Gravel filling .....	do .....	1,122	413	443
Stone filling .....	do .....	981		
Miter sills .....	Feet B. M. ....	1,088	8,600	8,600
Cofferdam timber .....	do .....	5,760		
Dam timber .....	do .....	40,720		
Framed timber .....	do .....	65,231		136,548
Sheathing .....	do .....	4,665		
Sheet piling .....	do .....	6,036		76,688
Foundation piles, delivered .....	Linear feet .....			3,074
Foundation piles, driven .....	do .....			3,957
Cluster piles, driven .....	do .....			960
Drain pipe .....	do .....	44	455	96
Valves and special irons, placed .....	Pounds .....	951	42,535	46,183
Stone, delivered .....	Cubic yards .....	3,584	8,829	
Dam timber, delivered .....	Feet B. M. ....	242,509	218,832	156,727
Framed timber, delivered .....	do .....	181,023	168,052	88,717
Sheet piles, delivered .....	do .....			14,272

## MAINTENANCE.

There have been no funds available for maintenance work. Considerable dredging is needed at the upper end of each lock pool and numerous snags and overhanging trees should be removed.

## NAVIGATION AND COMMERCE.

A portion of the traffic on this stream passed Locks 7, 8, and 9 and is given in detail in the report of operating and care of locks on Black Warrior River. In addition to this about 8,000 tons of logs, 500 tons of lumber, 400 tons of coal, 1,200 tons of Portland cement, 200 tons of cotton, and 200 tons of general merchandise were shipped from points below Lock 7, and there was a considerable traffic in logs on the pool between Locks 7 and 8, statistics of which are not available.

## (C) TOMBIGBEE RIVER.

## WORK OF THE PAST YEAR.

At Lock 1 proceedings have been instituted for acquiring additional land needed at this lock. The upper lock gates were assembled in place, the site of the abutment cleared and grubbed, three guard cribs placed at the upper approach and filled with stone, plant installed, construction of cofferdam commenced, part of filling placed behind bank wall, and work of excavating for abutment well advanced. Considerable stone for riprap has been delivered, and part of riprap was placed. All work done by hired labor.

Summary of work accomplished during the year:

Material excavated.....	cubic yards.....	32, 783
Clearing and grubbing.....	acres.....	6
Stone filling received and stored.....	cubic yards.....	887
Stone filling placed.....	do.....	492
Riprap stone quarried and delivered.....	do.....	3, 007
Riprap stone laid.....	square yards.....	639
Framed timber delivered.....	feet B. M.....	22, 000
Framed timber in place.....	do.....	20, 000
Lumber received and stored.....	do.....	68, 826
Cement delivered.....	barrels.....	3, 000
Artesian well bored, depth.....	feet.....	1, 012
Drain pipe laid.....	do.....	100
Cofferdam timber delivered.....	feet B. M.....	61, 628
Cofferdam timber (round) delivered.....	pieces.....	835

An unusually short low-water season prevented more work being done at this lock.

By newspaper advertisement, dated January 15, 1907, proposals were invited for building Lock and Dam No. 2, but no formal bids were received, and plans and specifications for building Locks and Dams Nos. 2 and 3 simultaneously have been prepared and submitted to the Chief of Engineers for approval, with request for authority to advertise the work for sixty days. The land needed for Lock 2 has been purchased and paid for, and friendly condemnation proceedings are soon to be instituted for the acquisition of title to that for Lock 3. Material for gates and special irons for Lock 2 has been received, and their construction is in progress at the Tuscaloosa shops. Material for Lock 3 gates and irons has been ordered.



## LOCK HOUSE.

One lock tender's house was built by hired labor at the site of Lock No. 2.

## DREDGE.

The hull for the 12-inch dredge was built and launched. All the necessary machinery has been delivered, and its installation on the dredge is in progress.

## TELEPHONE LINE.

Under emergency contract dated March 29, 1907, 60 miles of telephone line from Jackson, Ala., to Locks 1 and 2 is now under construction, and has been about 50 per cent completed. The extension of this line to Lock 3, about 20 miles, has been authorized.

## PRESENT CONDITION OF THE WORK.

Lock 1 is about 75 per cent completed, while Locks 2 and 3 and the necessary dredging has not yet been commenced.

For commercial statistics, see report on Tombigbee River, mouth to Demopolis.

*Money statements.*

## LOCKS AND DAMS.

July 1, 1906, balance unexpended.....	\$624, 776. 50
Amount appropriated by river and harbor act approved March 2, 1907.....	350, 000. 00
Amount appropriated by sundry civil act approved March 4, 1907..	233, 000. 00
Amount refunded from allotment for operating and care of locks on Black Warrior River, Alabama.....	3, 000. 00
June 30, 1907, sales of Government property.....	25. 00
June 30, 1907, refundment of overpayments.....	. 25
	<hr/>
	1, 210, 801. 75
June 30, 1907, amount expended during fiscal year, for works of improvement.....	432, 625. 44
	<hr/>
July 1, 1907, balance unexpended.....	778, 176. 31
July 1, 1907, outstanding liabilities.....	67, 000. 00
	<hr/>
July 1, 1907, balance available.....	711, 176. 31
July 1, 1907, amount covered by uncompleted contract.....	12, 500. 00
	<hr/>
Amount (estimated) required for completion of existing project..	Indefinite.
	<hr/>
{ Amount that can be profitably expended in fiscal year ending June 30, 1909, for works of improvement, in addition to the balance unexpended July 1, 1907.....	700, 000. 00
{ Submitted in compliance with requirements of sundry civil act of June 4, 1897.	

## DREDGE.

July 1, 1906, balance unexpended.....	\$37, 982. 57
June 30, 1907, amount expended during fiscal year, for works of improvement.....	34, 536. 87
	<hr/>
July 1, 1907, balance unexpended.....	3, 445. 70
July 1, 1907, outstanding liabilities.....	690. 00
	<hr/>
July 1, 1907, balance available.....	2, 755. 70

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## LOCK HOUSES.

July 1, 1906, balance unexpended.....	\$22, 141. 32
Amount appropriated by sundry civil act approved March 4, 1907.....	5, 000. 00
	<hr/>
	27, 141. 32
June 30, 1907, amount expended during fiscal year, for works of improvement.....	4, 873. 83
	<hr/>
July 1, 1907, balance unexpended.....	22, 267. 49

## APPROPRIATIONS.

### BLACK WARRIOR RIVER.

July 5, 1884.....	\$50, 000. 00
August 1, 1886.....	58, 250. 00
August 11, 1888.....	100, 000. 00
September 19, 1890.....	150, 000. 00
July 13, 1892.....	200, 000. 00
August 18, 1894.....	37, 500. 00
June 3, 1896.....	10, 000. 00
March 3, 1899.....	50, 000. 00
June 6, 1900.....	86, 824. 00
March 3, 1901.....	53, 676. 00
Amount transferred from Warrior River appropriation by act of June 13, 1902.....	14, 000. 00
	<hr/>
	808, 250. 00
June 30, 1906, from sales of Government property.....	201. 92
	<hr/>
	\$808, 451. 92

### WARRIOR AND TOMBIGBEE RIVERS.

March 3, 1875.....	\$25, 000. 00
August 14, 1876.....	15, 000. 00
June 18, 1878.....	28, 000. 00
March 3, 1879.....	20, 000. 00
	<hr/>
	88, 000. 00

### WARRIOR RIVER.

Previous projects:	
June 14, 1880.....	\$20, 000. 00
March 3, 1881.....	10, 622. 00
August 2, 1882.....	10, 000. 00
July 5, 1884.....	12, 000. 00
August 5, 1886.....	18, 750. 00
August 11, 1888.....	18, 000. 00
Septemebr 19, 1890.....	45, 000. 00
July 13, 1892.....	75, 000. 00
August 18, 1894.....	40, 000. 00
June 3, 1896.....	70, 000. 00
	<hr/>
	319, 372. 00
Existing project:	
March 3, 1899.....	220, 000. 00
June 6, 1900.....	200, 000. 00
June 6, 1900 (emergency act—allotted).....	3, 691. 24
March 3, 1901.....	240, 000. 00
June 13, 1902.....	374, 000. 00
March 3, 1903.....	200, 000. 00
April 28, 1904.....	225, 000. 00
March 3, 1905.....	15, 000. 00

## Existing project—Continued.

March 3, 1905 (allotment)-----	\$7, 500. 00	
June 30, 1906-----	60, 000. 00	
June 30, 1906 (allotment)-----	86, 966. 00	
	<u>1, 632, 157. 24</u>	
Less amount transferred to Black Warrior River by act of June 13, 1902-----	\$14, 000. 00	
Amount diverted for survey for location of lock sites in Tombigbee River, as authorized by act of June 13, 1902-----	13, 000. 00	
	<u>27, 000. 00</u>	
	<u>1, 605, 157. 24</u>	
June 30, 1906, from sales of Government property-----	467. 11	
Amount refunded from allotment for operating and care of locks, Black Warrior River----	3, 000. 00	
	<u>\$1, 608, 624. 35</u>	

## TOMBIGBEE RIVER.

June 13, 1892-----	\$50, 000. 00	
August 18, 1894-----	50, 000. 00	
June 3, 1896-----	50, 000. 00	
March 3, 1899-----	50, 000. 00	
March 3, 1905 (including amounts for dredge and lock houses)-----	92, 500. 00	
June 30, 1906 (including amount for lock houses)--	456, 500. 00	
March 4, 1907 (including amount for lock houses)--	238, 000. 00	
Amount diverted from Warrior River appropriation for survey for location of lock sites, as directed by act of June 13, 1902-----	13, 000. 00	
	<u>1, 000, 000. 00</u>	
June 30, 1906, from sales of Government property--	175. 00	
	<u>1, 000, 175. 00</u>	

## BLACK WARRIOR, WARRIOR, AND TOMBIGBEE RIVERS.

March 2, 1907-----	\$350, 000. 00	
June 30, 1907, from sales of Government property--	25. 00	
June 30, 1907, refundment of overpayments-----	. 25	
	<u>350, 025. 25</u>	
Total -----	<u>4, 174, 648. 52</u>	

## CONTRACTS IN FORCE.

With W. K. Saulsbury, dated May 26, 1905 (emergency contract), for furnishing and delivering 16,000 tons of stone at abutment site for Lock No. 1, on Tombigbee River near Demopolis, Ala., at the rate of \$1.75 per ton of 2,000 pounds. Delivery of stone was commenced in June, 1905; was to be completed by December 31, 1905, but time for completion was extended.

Supplemental contract with W. K. Saulsbury, dated January 30, 1906, approved by the Chief of Engineers March 1, 1906, providing that \$1.25 per ton might be paid the contractor for stone delivered at Demopolis, Ala., the balance of 50 cents per ton, to be paid him upon completion of delivery of the stone at abutment site for Lock No. 1, on the Tombigbee River near Demopolis, Ala., as provided in the original contract.

This contract was finally completed in May, 1907.

With Fordyce Lumber Company, dated January 20, 1906 (emergency contract), for furnishing and delivering lumber at Locks 1, 2, and 3, Warrior and Tombigbee rivers, Alabama, as follows:

275,533 feet B. M. at Lock 1, at \$14.50 per 1,000 feet B. M.  
 455,117 feet B. M. at Lock 1, at \$22.50 per 1,000 feet B. M.  
 27,000 feet B. M. at Lock 1, at \$26 per 1,000 feet B. M.  
 12,308 feet B. M. at Lock 1, at \$22 per 1,000 feet B. M.  
 175,700 feet B. M. at Lock 2, at \$13.50 per 1,000 feet B. M.  
 278,935 feet B. M. at Lock 2, at \$22.50 per 1,000 feet B. M.  
 17,650 feet B. M. at Lock 2, at \$25 per 1,000 feet B. M.  
 8,808 feet B. M. at Lock 2, at \$22 per 1,000 feet B. M.  
 85,080 feet B. M. at Lock 3, at \$13.50 per 1,000 feet B. M.  
 214,135 feet B. M. at Lock 3, at \$21.50 per 1,000 feet B. M.  
 17,650 feet B. M. at Lock 3, at \$26 per 1,000 feet B. M.  
 8,808 feet B. M. at Lock 3, at \$21 per 1,000 feet B. M.

Delivery of lumber under this contract was commenced in the latter part of January, 1906, and was to have been completed by August 1, 1906, but time for completion has been extended.

With George Vise, dated March 29, 1907 (emergency contract), for furnishing and erecting telephone poles for telephone line from Lock 1 to Lock 2, Tombigbee River, thence to Jackson, Ala., at the rate of \$1.75 each for telephone poles delivered and accepted, and 75 cents each for erecting said poles. Work commenced April 8, 1907; was to be completed by June 8, 1907, but time of completion has been extended.

#### (D) TOMBIGBEE RIVER, MOUTH TO DEMOPOLIS.

The existing project for this improvement, as modified by the river and harbor act of June 13, 1902, provides for maintenance of the channel obtained under earlier appropriations between the mouth of the Tombigbee River and Demopolis, Ala., a distance of 185 miles, by the removal of obstructions from the channel, the cutting of overhanging trees on the banks, and the repair of dikes.

The only work performed on this section of the river during the past fiscal year was done by the snag boat *Black Warrior* during the months of August, September, and October, 1906, at which time about 400 of the worst obstructions were removed from the improved channel. Since October the snag boat has been used for towing and delivering material in connection with the construction of Lock and Dam No. 1, Tombigbee River. This boat has lately been extensively repaired and is ready to resume snagging operations as soon as the stage of water in the Tombigbee River will permit.

#### Money statement.

July 1, 1906, balance unexpended.....	\$14,349.92
Amount appropriated by river and harbor act approved March 2, 1907.....	16,000.00
	<hr/> 30,349.92
June 30, 1907, amount expended during fiscal year, for maintenance of improvement.....	3,781.62
	<hr/> 26,568.30
July 1, 1907, balance unexpended.....	
{ Amount that can be profitably expended in fiscal year ending June 30, 1909, for maintenance of improvement, in addition to the balance unexpended July 1, 1907.....	16,000.00
{ Submitted in compliance with requirements of sundry civil act of June 4, 1897, and of section 7 of the river and harbor act of 1899.	

## APPROPRIATIONS.

## Previous projects:

June 10, 1872.....	\$5,332.95	
June 14, 1880 (below Vienna).....	15,000.00	
March 3, 1881 (below Vienna).....	7,988.00	
August 2, 1882 (below Vienna).....	12,500.00	
July 5, 1884 (below Vienna).....	15,000.00	
August 5, 1886 (below Vienna).....	11,250.00	
August 11, 1888 (below Vienna).....	6,000.00	
September 19, 1890.....	55,000.00	
July 13, 1892.....	<sup>a</sup> 75,000.00	
August 18, 1894.....	<sup>a</sup> 25,000.00	
June 3, 1898.....	<sup>a</sup> 25,000.00	
Allotted from emergency act June 6, 1900.....	3,980.81	
		\$257,051.76
June 13, 1902 (allotment).....	16,000.00	
Allotted from act June 13, 1902.....	3,776.31	
March 3, 1905.....	15,000.00	
March 2, 1907.....	16,000.00	
		50,776.31
June 30, 1907, from sales of Government property.....		72.69
Total.....		307,900.76

## COMMERCIAL STATISTICS.

Commerce of the Tombigbee River, mouth to Demopolis, during the calendar year ending December 31, 1906, consisted of cotton, cotton seed, logs, timber, breadstuffs, fertilizer, farm supplies, provisions, machinery, and general merchandise. The amount of this commerce was about 414,932 tons, valued at \$6,700,392.

## (E) DEMOPOLIS TO COLUMBUS.

Between June 18, 1906, and December 22, 1906, about 110 miles of river were worked over with the snag boat *Vienna*. In January, 1907, the *Vienna* was brought down to Demopolis and laid up. During the winter she was overhauled and repaired, and in May, 1907, she was towed to a point about 12 miles below Columbus, at which point she will resume operations as soon as the stage of river will permit, working downstream in the removal of obstructions.

*Money statement.*

July 1, 1906, balance unexpended.....	\$7,113.08
Amount appropriated by river and harbor act approved March 2, 1907.....	12,000.00
	19,113.08
June 30, 1907, amount expended during fiscal year, for maintenance of improvement.....	5,049.65
July 1, 1907, balance unexpended.....	14,063.43
July 1, 1907, outstanding liabilities.....	510.00
July 1, 1907, balance available.....	13,553.43
Amount that can be profitably expended in fiscal year ending June 30, 1909, for maintenance of improvement, in addition to the balance unexpended July 1, 1907.....	
Submitted in compliance with requirements of sundry civil act of June 4, 1897, and of section 7 of the river and harbor act of 1890,	
	12,000.00

\* Portions of Tombigbee River appropriations applied to snagging work.

## APPROPRIATIONS.

June 14, 1880 (Columbus to Vienna).....	\$12, 000
March 3, 1881 (Columbus to Vienna).....	6, 390
August 2, 1882 (Vienna to Fulton).....	7, 500
July 5, 1884 (Vienna to Fulton).....	10, 000
August 5, 1886 (Vienna to Fulton).....	7, 500
August 11, 1888 (Vienna to Fulton).....	6, 500
September 19, 1890.....	15, 000
July 13, 1892.....	35, 000
August 18, 1894.....	50, 000
June 3, 1896.....	50, 000
March 3, 1899.....	10, 000
March 3, 1905 (allotment).....	10, 000
March 2, 1907 (allotment).....	12, 000
<b>Total.....</b>	<b>231, 890</b>

## COMMERCIAL STATISTICS.

Articles.	Quantity.	Value.
	<i>Tons.</i>	
Cotton.....	1, 604	\$324, 782
Cotton seed.....	4, 578	70, 645
General merchandise.....	3, 598	76, 572
<b>Total.....</b>	<b>9, 775</b>	<b>471, 999</b>

## (F) COLUMBUS TO WALKER'S BRIDGE.

No work has been done on this improvement since September, 1905, owing to lack of funds, nor have any expenditures been made.

*Money statement.*

July 1, 1906, balance unexpended.....	\$291. 95
Amount appropriated by river and harbor act approved March 2, 1907.....	2, 000. 00
July 1, 1907, balance unexpended.....	<u>2, 291. 95</u>

{ Amount that can be profitably expended in fiscal year ending June 30, 1909, for maintenance of improvement, in addition to the balance unexpended July 1, 1907.....	5, 000. 00
{ Submitted in compliance with requirements of sundry civil act of June 4, 1897, and of section 7 of the river and harbor act of 1899.	

All work done is for the purpose of maintaining the high-water channel.

## APPROPRIATIONS.

For Tombigbee River above Columbus :	
June 10, 1872.....	\$4, 667. 05
June 18, 1878.....	12, 000. 00
March 3, 1879.....	10, 000. 00
March 14, 1880.....	4, 000. 00
March 3, 1881.....	1, 000. 00
	<u>\$31, 667. 05</u>
For Tombigbee River, Fulton to Columbus :	
July 13, 1892.....	6, 000. 00
August 18, 1894.....	4, 000. 00
June 3, 1896.....	8, 000. 00
March 3, 1899.....	5, 000. 00
	<u>23, 000. 00</u>
For Tombigbee River, Walker's bridge to Fulton :	
August 11, 1888.....	4, 000. 00
September 19, 1890.....	4, 000. 00
July 13, 1892 (maintenance).....	3, 000. 00

**For Tombigbee River, Walker's bridge to Fulton—Cont'd.**

August 18, 1894 (maintenance)-----	\$1, 000. 00
June 3, 1896 (maintenance)-----	1, 000. 00
March 3, 1899 (maintenance)-----	1, 000. 00
	<hr/> \$14, 000. 00

**For Tombigbee River, Columbus to Walker's bridge:**

June 13, 1902 (allotment)-----	4, 000. 00
March 3, 1905 (allotment)-----	2, 000. 00
March 2, 1907 (allotment)-----	2, 000. 00
	<hr/> 8, 000. 00

Total ----- 76, 667. 05

**COMMERCIAL STATISTICS.**

Commerce on Tombigbee River between Columbus and Walker's bridge during the calendar year ending December 31, 1906, consisted of 1,000 tons of heading bolts and general merchandise, valued at \$40,000.

**R 4.****OPERATING AND CARE OF LOCKS AND DAMS ON BLACK WARRIOR RIVER, ALABAMA.****GENERAL CONDITION OF LOCKS.****LOCKS 7, 8, 9, 10, 11, 12, AND 13, BLACK WARRIOR RIVER.**

Locks 7, 8, and 9 are in fair condition, though additional riprap for bank protection and additional stone filling below dams are needed to check erosion. Replacing pile clusters above these locks with timber guide cribs filled with stone was begun late in the last working season, and four cribs at Lock 7 were completed. All timber for new cribs was delivered at Locks 8 and 9, and one crib at Lock 8 was completed.

Locks 10, 11, and 12 are in good condition, though some dredging is needed to remove flood deposit from locks and approaches. This work is now in progress. Lock 13 is in excellent condition, though some dredging is needed in lower approach to lock.

**WORK OF PAST YEAR.**

*Lock 7.*—Underbrush and piles of drift cleared off of reservation. About 8,000 cubic yards flood deposit dredged from lock chamber and approaches to lock. Four guide cribs built to replace pile clusters along upper approach to lock, 44,000 feet B. M. timber and 1,807 tons of stone being used in their construction; 2,112 tons stone filled below dam to check erosion. Bank below abutment, which was badly eroded, graded to an approximate slope by moving about 3,300 cubic yards of earth. This area was protected by the use of about 225 cords of brush and 2,083 tons of stone and quarry waste. Wire fence has been built, inclosing all Government land on both sides of the river. Lock house has been painted. Bank back of lock and lock mound have been graded and sodded with Bermuda grass.

*Lock 8.*—All timber and 749 tons of stone for new guide cribs delivered. One crib 40 feet long was built, using 10,248 feet B. M. timber and about 700 tons stone filling. Lock house has been painted. Wire fence has been built around Government reservation. Under-

growth cleared off reservation, and Bermuda grass planted on river banks.

*Lock 9.*—Timber for new guide cribs delivered. Underbrush and drift cleared off reservation. A number of trees, which had caved off river bank into upper lock approach, pulled out and cut up. About 4,800 cubic yards of flood deposit dredged from lock chamber and approaches to lock. Wire fence built around Government reservation.

*Lock 10.*—General repairs to plant kept up at Tuscaloosa shops, which are located at this lock. Flood deposit removed from around lower gates. Lock-tender's house and fences painted.

*Lock 11.*—Lower bank wall gate, which had been badly damaged during high water in March, 1906, taken down and rebuilt. Flood deposit removed from lock chamber. Lock-tender's house and fences painted.

*Lock 12.*—Lock-tender's house and fences painted. Dredging flood deposit from lock chamber and approaches to this lock now in progress.

*Lock 13.*—Lock-tender's house painted. Well 77 feet deep drilled on reservation, furnishing an abundant supply of excellent water. Flood deposit removed from lock chamber. Drain ditches cut. Iron-work painted.

*Statement of expenditures for operating and caring for Locks 7, 8, 9, 10, 11, 12 and 13, Black Warrior River, Alabama, during the fiscal year ending June 30, 1906, submitted in accordance with Circular No. 12, Office of Chief of Engineers, dated July 31, 1897.*

Items.	Allotted.	Expended.	Balance.	Minus balance.
Salaries of inspectors, lock masters, and lockmen.....	\$9,960.00	\$8,774.49	\$1,185.51	.....
Extra labor.....	1,500.00	1,400.92	99.08	.....
Riprap bank protection, 8,000 tons, at \$2 per ton.....	6,000.00	6,887.92	.....	\$887.92
Stone filling below dams, 8,000 tons, at \$2 per ton.....	6,000.00	4,658.65	1,341.35	.....
Replacing concrete paving at Lock 7.....	300.00	.....	300.00	.....
Guide cribs at Locks 7, 8, and 9.....	15,000.00	7,179.68	7,820.32	.....
Removing flood deposits and obstructions from locks and approaches.....	5,000.00	3,598.50	1,406.50	.....
Painting and repairs to gates, valves, and ironwork.....	4,000.00	2,963.67	1,036.33	.....
Painting and repairs to lock houses.....	1,500.00	1,479.56	20.44	.....
Filling above dams.....	1,000.00	69.25	930.75	.....
Wells at Locks 10, 11, and 13.....	1,000.00	193.59	806.41	.....
Wire fences at Locks 7, 8, and 9.....	300.00	832.04	.....	532.04
Repairs to steamer John Mills.....	3,000.00	3,000.00	.....	.....
Tools and plant.....	2,000.00	3,337.66	.....	1,337.66
Fuel, lights, and oil.....	1,000.00	347.50	652.50	.....
Telephone service and maintenance.....	500.00	687.55	.....	187.55
Incidentals.....	5,000.00	894.92	4,105.08	.....
Outstanding liabilities.....	2,470.25	2,470.25	.....	.....
Total.....	65,580.25	48,721.15	19,704.27	2,896.17

## COMMERCIAL STATISTICS.

*Traffic.*

Vessels, etc.	Lock No. 7.			Lock No. 8.			Lock No. 9.			Lock No. 10.		
	Asc- cend- ing.	De- scend- ing.	To- tal.	Asc- cend- ing.	De- scend- ing.	To- tal.	Asc- cend- ing.	De- scend- ing.	To- tal.	Asc- cend- ing.	De- scend- ing.	To- tal.
Passenger boats.....	5	5	10	5	5	10	.....	.....	.....	.....	.....	.....
Towboats.....	2	1	3	61	59	120	2	1	3	.....	.....	.....
Government boats.....	31	30	61	31	31	62	80	60	41	40	.....	81
Other barges.....	4	.....	4	88	82	170	4	.....	4	3	.....	4
Government barges.....	110	123	233	110	114	224	114	238	128	129	252	252
Government small craft.....	14	12	26	9	9	18	8	16	6	8	.....	.....



## Traffic—Continued.

Vessels, etc.	Lock No. 7.			Lock No. 8.			Lock No. 9.			Lock No. 10.		
	As-cend-ing.	De-scend-ing.	To-tal.	As-cend-ing.	De-scend-ing.	To-tal.	As-cend-ing.	De-scend-ing.	To-tal.	As-cend-ing.	De-scend-ing.	To-tal.
Small craft.....	2	6	8	6	8	14	6	8	14	26	23	49
Rafts.....		24	24		33	33		27	27		15	15
Total.....	168	201	369	310	341	651	164	188	352	201	210	413
Lockages.....	36	54	90	100	118	218	44	70	114	52	52	102

Vessels, etc.	Lock No. 11.			Lock No. 12.			Lock No. 13.		
	As-cend-ing.	De-scend-ing.	To-tal.	As-cend-ing.	De-scend-ing.	To-tal.	As-cend-ing.	De-scend-ing.	To-tal.
Tow boats.....	1	1	2	1	1	2			
Government boats.....	54	54	108	57	56	113			
Coal barges.....	1	1	2	1	1	2			
Government barges.....	118	119	237	117	116	233			
Government small craft.....	52	28	80	30	24	54	5	5	10
Small craft.....	15	14	29	15	16	31	87	41	78
Rafts.....		12	12		11	11		5	6
Total.....	221	229	450	221	225	446	42	51	93
Lockages.....	78	85	163	91	103	194	101	104	205

## Commerce.

[In tons.]

Lock and date.	Coal.	Corn.	Flour.	Cotton.	Hay.	Cotton seed.	Stone.	Loga.	Lumber.	Fertilizer.	Oats.	General and miscel-laneous.	Total.
<b>Lock No. 7.</b>													
July, 1906.....									382				382
August, 1906.....								80	596				676
September, 1906.....									200				200
October, 1906.....	124						1,597		400				2,121
November, 1906.....							1,920		326			4	2,250
December, 1906.....							1,686		260				1,945
January, 1907.....	445	40		90			1,555			40		20	2,190
February, 1907.....	219	33	34	77		185	1,067		220	140	14		1,989
March, 1907.....	579	42		89	2	17	1,788			300		23	2,790
April, 1907.....	589						1,877	160	190			12	2,268
May, 1907.....	477						2,746	160	140				3,523
June, 1907.....	154						1,049					9	1,212
Total.....	2,587	115	34	206	2	202	14,784	400	2,654	480	14	68	21,546
<b>Lock No. 8.</b>													
July, 1906.....								1,012	329		3	2	1,846
August, 1906.....					8			2,232	502			2	2,789
September, 1906.....					2			376	200			17	595
October, 1906.....	124						1,737	42	380			20	2,308
November, 1906.....							2,214		381			4	2,549
December, 1906.....							1,958		260				2,218
January, 1907.....	445	40		90			1,555	78		40		20	2,268
February, 1907.....	219	33	34	77		185	1,067	190	220	140	14		2,169
March, 1907.....	581	42		89	2	17	2,283	280		300		23	3,517
April, 1907.....	307						2,982	160	130				4,529
May, 1907.....	477						2,746	780	140				4,143
June, 1907.....	154						1,049	1,060				9	2,272
Total.....	2,607	115	34	206	7	202	15,491	6,200	2,492	480	17	97	27,948

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## Commerce—Continued.

[In tons.]

Date.	Coal.	Logs.	Lumber.	Stone.	General and miscellaneous.	Total.
<i>Lock No. 9.</i>						
July, 1906			329			329
August, 1906		80	518			598
September, 1906			200			200
October, 1906	124		380	1,737	20	2,261
November, 1906			331	2,214	4	2,549
December, 1906			260	1,958		2,218
January, 1907	445	69		1,555	20	2,089
February, 1907	219	160	220	1,067		1,666
March, 1907	881	280		2,233	28	3,417
April, 1907	307	160	130	882		1,529
May, 1907	477	780	140	2,746		4,143
June, 1907	154	460		1,049	9	1,672
Total	2,607	1,989	2,508	15,491	76	22,671
<i>Lock No. 10.</i>						
July, 1906			87			87
August, 1906						
September, 1906						
October, 1906	248		466	2,600		3,314
November, 1906			70	2,214		2,284
December, 1906				1,958		1,958
January, 1907	445	60	90	1,555	8	2,158
February, 1907	511	48		1,815		2,374
March, 1907	564	21		1,486	21	2,092
April, 1907	805		120	932		1,357
May, 1907	477			2,746		3,223
June, 1907	222			1,049	10	1,281
Total	2,772	129	833	16,355	39	20,128
<i>Lock No. 11.</i>						
July, 1906	77		72			149
August, 1906					4	4
September, 1906			40			40
October, 1906		240	114	2,352		2,706
November, 1906	50		70	2,214		2,334
December, 1906				1,958		1,958
January, 1907	567	60	90	1,555		2,272
February, 1907	429	48		1,815		2,292
March, 1907	589	21		1,486	16	2,112
April, 1907	305		120	932		1,357
May, 1907	523			2,746		3,269
June, 1907	188			1,049		1,237
Total	2,728	369	506	16,107	20	19,730
<i>Lock No. 12.</i>						
July, 1906	77		72			149
August, 1906					4	4
September, 1906		60	40			100
October, 1906	124		114	2,070		2,308
November, 1906	50		70	2,214		2,334
December, 1906				1,958		1,958
January, 1907	567	60	90	1,555		2,272
February, 1907	429	48		1,815		2,292
March, 1907	589	21		1,486	46	2,142
April, 1907	305		120	932		1,357
May, 1907	523			2,746		3,269
June, 1907	188			1,049		1,237
Total	2,852	189	506	14,825	50	18,422
<i>Lock No. 13.</i>						
July, 1906					1	1
August, 1906						
September, 1906						
October, 1906						
November, 1906						
December, 1906						
January, 1907		38				38
February, 1907		43				43
March, 1907		68				68
April, 1907			82			82
May, 1907						
June, 1907			70			70
Total		149	152		1	302

*Comparative table of commerce through locks, fiscal year ending June 30.*

Items.	Lock No. 7.			Lock No. 8.			Lock No. 9.		
	1905.	1906.	1907.	1905.	1906.	1907.	1905.	1906.	1907.
Steamboats.....number..	120	96	74	123	117	192	127	96	68
Barges.....do.....	177	157	237	247	191	394	285	157	232
Steamboats.....tonnage..	13,568	9,450	8,289	18,065	14,080	26,608	20,130	6,936	5,889
Barges.....do.....	13,458	14,596	22,310	20,892	17,267	34,460	24,415	14,016	21,630
Passengers.....number..		8			8	267			
Lockages.....do.....	138	102	90	150	137	228	141	108	114
Freight carried:									
Coal.....tons.....	2,065	2,369	2,587	2,140	2,262	2,607	2,359	2,262	2,607
Corn.....do.....			115	5	14	115	2		
Oil.....do.....									
Flour.....do.....		20	34	47	20	34			
Sugar.....do.....									
Cotton.....do.....	403	388	206	264	349	206	131		
Hay.....do.....	10		2			7			
Steel rails.....do.....							17		
Cotton seed.....do.....		275	202	28	275	202	54		
Stone.....do.....	7,380	7,475	14,784	13,435	7,334	15,491	17,804	7,334	15,491
Oats.....do.....		20	14		20	17			
Cotton-seed meal.....do.....					18				
Fertilizer.....do.....		289	480	321	289	480	177		
Sand and gravel.....do.....				1,163					
Steel gate material, tons.....		420			420			420	
Logs.....do.....	2,306	1,073	400	487	2,454	6,200	206	1,286	1,989
Lumber.....do.....	120	1,342	2,654	140	1,254	2,492	164	1,104	2,508
General and miscellaneous.....tons..	649	651	68	582	696	97	328	126	76
Total.....	12,953	14,322	21,546	18,613	15,405	27,948	21,242	12,531	22,671

## LOCK NO. 10.

Items.	1897.	1898.	1899.	1900.	1901.	1902.	1903.	1904.	1905.	1906.	1907.
Steamboats.....number..	67	233	172	71	94	59	305	204	127	86	84
Barges.....do.....	89	403	118	87	180	131	420	451	299	156	256
Steamboats.....tonnage..	(a) 6,165	3,365	1,892	3,135	3,621	18,345	18,693	18,560	9,807	7,762	
Barges.....do.....	(a) 29,032	5,770	5,465	19,266	12,884	24,990	30,930	24,700	13,927	23,354	
Passengers.....number..	58	203	348	36	28		101				
Lockages.....do.....	228	537	220	119	199	118	434	276	150	208	102
Freight carried:											
Coal.....tons.....	1,925	2,223	1,059	615	3,305	240	3,860	1,476	2,689	2,260	2,772
Corn.....do.....					12						
Cotton.....do.....				38							
Hay.....do.....					10						
Steel.....do.....				28			2			120	
Cement.....do.....			88	22							
Stone.....do.....		5,076			2,082	3,938	13,096	14,763	14,783	7,333	16,855
Sand and gravel.....do.....		148			126	45	256	1,725	1,132		
Oats.....do.....					18						
Cross-ties.....do.....		113									
Hewn timber.....do.....		5,264									
Logs.....do.....	149	4	342	138		87	533	638	487	491	129
Lumber.....do.....	81	352	182	596	1,701	525	313	276	126	266	833
General and miscellaneous.....tons..	14	111	90	219	293	255	106	8	190	478	39
Total.....	2,169	13,291	1,761	1,656	7,549	5,090	18,166	18,906	20,801	10,948	20,128

\* No record kept.

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## Comparative table of commerce through locks, etc.—Continued.

### LOCK NO. 11.

Items.	1897.	1898.	1899.	1900.	1901.	1902.	1903.	1904.	1905.	1906.	1907.
Steamboats...number..	294	638	297	104	371	268	653	347	164	84	110
Barges.....do.....	235	439	147	106	162	268	464	479	843	160	239
Steamboats...tonnage..	(a)	13,965	6,481	2,667	9,111	8,708	27,007	24,138	26,003	9,021	10,194
Barges.....do.....	(a)	33,600	7,800	6,760	21,479	24,812	27,220	32,486	26,890	14,307	22,430
Passengers...number..	1,342	2,994	721	71	1,275	494	1,750	677			
Lockages.....do.....	584	774	351	208	506	456	981	639	259	211	163
Freight carried:											
Coal.....tons.....	4,706	4,139	1,269	707	3,945	450	4,211	1,852	3,047	2,450	2,728
Corn.....do.....		25			12						
Cotton.....do.....				38							
Hay.....do.....					10						
Steel.....do.....		22		20							
Cement.....do.....		9	88	22							
Stone.....do.....		5,210			1,277	6,320	13,096	14,783	18,276	7,123	16,107
Sand and gravel.....do.....		148			68	45	202	1,725	957		
Oats.....do.....					18						
Posts.....do.....		14									
Cross-ties.....do.....		113									
Hewn timber.....do.....		5,527									
Logs.....do.....	165	16	392	138		87	533	677	529	479	369
Lumber.....do.....	146	514	346	626	1,718	806	154	170	251	60	506
General and miscellaneous.....tons..	44	320	110	285	430	157	206	158	320	20	20
Total.....	5,061	16,057	2,205	1,836	7,478	7,864	18,402	19,380	23,380	10,132	19,730

\* No record kept.

### LOCK NO. 12.

Items.	1897.	1898.	1899.	1900.	1901.	1902.	1903.	1904.	1905.	1906.	1907.
Steamboats...number..	309	638	308	111	478	471	662	348	162	86	115
Barges.....do.....	211	474	151	110	271	543	679	587	309	156	235
Steamboats...tonnage..	(a)	13,382	6,729	2,948	11,635	13,887	27,196	24,284	23,139	9,807	10,679
Barges.....do.....	(a)	35,790	8,060	7,020	28,430	38,942	35,960	36,000	25,420	13,927	22,130
Passengers...number..	1,538	3,089	732	111	1,482	528	1,911	857			
Lockages.....do.....	551	815	372	223	614	660	901	513	240	208	194
Freight carried:											
Coal.....tons.....	4,699	4,618	1,456	757	4,255	625	4,211	1,932	3,007	2,450	2,862
Corn.....do.....		25			12						
Cotton.....do.....				38							
Hay.....do.....					10						
Steel.....do.....		22		20							
Cement.....do.....		9	88	22							
Stone.....do.....		5,290			1,804	9,314	13,096	14,872	18,276	7,123	14,825
Sand and gravel.....do.....		148			845	1,819	2,001	2,642	380		
Oats.....do.....					18						
Posts.....do.....		14									
Cross-ties.....do.....		113									
Hewn timber.....do.....		5,728									
Logs.....do.....	178	74	332	138		87	590	663	529	478	189
Lumber.....do.....	139	514	346	626	1,718	806	154	170	381	60	506
General and miscellaneous.....tons..	44	320	110	285	487	170	218	158	320	20	50
Total.....	5,060	16,875	2,332	1,836	9,149	12,820	20,270	20,432	22,893	10,132	18,422

\* No record kept.

• *Comparative table of commerce through locks, etc.—Continued.*

## LOCK NO. 13.

Items.	1906.	1907.
Steamboats.....number.....	4	.....
Barges.....do.....	38	.....
Steamboats.....tonnage.....	388	.....
Barges.....do.....	3,420	.....
Passengers.....number.....	90	205
Lockages.....do.....	134	90
Freight carried:		
Coal.....tons.....	.....	.....
Lugs.....do.....	438	149
Lumber.....do.....	.....	152
General and miscellaneous.....do.....	8	1
Stone.....do.....	2,789	.....
Total.....	3,180	302

## R 5.

## IMPROVEMENT OF PASCAGOULA RIVER, MISSISSIPPI.

Under date of June 16, 1905, two contracts were entered into for continuing work on the project to secure a 17-foot channel. The work comprises two sections. Section 1 reaches from a point in Dog River 3 miles above its mouth down the Pascagoula River to a point in Mississippi Sound 4,500 feet southeast of light-house beacon C, and section 2 reaches from the lower end of section 1 to the 17-foot contour in Mississippi Sound. The work in section 1 was let to the Southern Dredging Company, of Mobile, Ala., at the rate of 9.98 cents per cubic yard, place measurement, and that in section 2 to John Anderson, of Gulfport, Miss., at the rate of 8 cents per cubic yard, place measurement.

The contract for section 1 was completed May 2, 1907. During the fiscal year 740,898.6 cubic yards of material were removed, resulting in a channel 17 feet deep at mean low water, 38,005 feet long, and 125 to 150 feet wide. The channel above the railroad bridge has been completed in accordance with the project.

The contract for section 2 was completed June 15, 1907, 295,755 cubic yards being dredged during the year and 73,712.9 cubic yards redredged over shoals formed during the progress of the work. The length of channel dredged was 10,450 feet, and of channel redredged 5,000 feet. The width of channel formed equals 125 feet, with 17 feet mean low-water depth.

The work in both sections was performed by hydraulic dredges, and the yardage removed was measured in place.

Expenditures during the past fiscal year amounted to \$116,974.41, of which \$40,000 was applied to maintenance and the balance to original dredging under the contract, including the cost of surveys and other contingent expenses.

With the available funds it is proposed to continue the improvement and the maintenance of same, by dredging, and to apply part of the appropriation as authorized by the river and harbor act of March 2, 1907, to the purchase or construction of a hydraulic dredging plant for the harbors of the Mississippi coast.

The pipe-line dredge *Barnard* is to be borrowed from the Southwest Pass work about July 1, 1907, and a two months' trial made of her on the Pascagoula channel.

*Money statement.*

July 1, 1906, balance unexpended	\$117, 622. 08
June 30, 1907, refundment of overpayments	4. 34
Amount appropriated by river and harbor act approved March 2, 1907.	200, 000. 00
	<u>317, 626. 42</u>
June 30, 1907, amount expended during fiscal year:	
For works of improvement	\$76, 974. 41
For maintenance of improvement	40, 000. 00
	<u>116, 974. 41</u>
July 1, 1907, balance unexpended	200, 652. 01
July 1, 1907, outstanding liabilities	1, 300. 00
	<u>199, 352. 01</u>
July 1, 1907, balance available	199, 352. 01
Amount (estimated) required for completion of existing project	<u>360, 622. 00</u>
Amount that can be profitably expended in fiscal year ending June 30, 1909, in addition to the balance unexpended July 1, 1907:	
For works of improvement	\$200, 000. 00
For maintenance of improvement	50, 000. 00
	<u>250, 000. 00</u>
Submitted in compliance with requirements of sundry civil act of June 4, 1897, and of section 7 of the river and harbor act of 1899.	

APPROPRIATIONS.

March 2, 1827	\$8, 000. 00	June 6, 1900	<sup>b</sup> \$199, 600. 00
May 23, 1828	17, 500. 00	June 13, 1902	25, 000. 00
August 30, 1852	5, 000. 00	March 3, 1903	100, 000. 00
June 17, 1878	10, 000. 00	April 28, 1904	25, 000. 00
March 3, 1879	14, 000. 00	March 3, 1905	150, 000. 00
June 14, 1880	20, 000. 00	March 2, 1907	200, 000. 00
August 5, 1886	20, 000. 00	June 30, 1907, refundment of overpayments	4. 34
August 5, 1886 (transferred from Horn Island Pass appropriation)	5, 000. 00	Total	<u>899, 104. 34</u>
August 11, 1888	27, 000. 00	Less cost of Horn Island Pass dredging in 1897 from appropriations of 1894 and 1896	7, 682. 40
September 19, 1890	<sup>a</sup> 18, 000. 00		
July 13, 1892	<sup>a</sup> 16, 200. 00	Balance	<u>891, 421. 94</u>
August 18, 1894	<sup>a</sup> 7, 600. 00		
June 3, 1896	<sup>a</sup> 1, 200. 00		
March 3, 1899	<sup>b</sup> 30, 000. 00		

CONTRACTS IN FORCE.

With John Anderson, dated June 16, 1905, approved by the Chief of Engineers June 28, 1905, for dredging in section 2, Mississippi Sound (at the mouth of Pascagoula River), at the rate of 8 cents per cubic yard for material removed by the hydraulic process, measured in place. Work commenced November 3, 1905; was to be completed by June 30, 1906. Time for completion was extended, and contract completed June 15, 1907.

<sup>a</sup> Portions of Pascagoula River appropriations applied to dredging work.

<sup>b</sup> Excluding a total of \$88,000 applied to dredging in Horn Island anchorage.

With Southern Dredging Company, dated June 16, 1905, approved by the Chief of Engineers August 3, 1905, for dredging in section 1, Dog and Pascagoula rivers and Mississippi Sound, Mississippi, at the rate of 9.98 cents per cubic yard for material removed by the hydraulic process, measured in place. Work commenced December 23, 1905; was to be completed by June 30, 1906. Time of completion was extended, and contract completed May 2, 1907.

### COMMERCIAL STATISTICS.

The following statement concerning the clearances from the port of Pascagoula for the calendar year ending December 31, 1906, was furnished by the United States custom-house at Pascagoula, Miss.:

Foreign clearances .....	164	Net tonnage .....	75, 532
Domestic clearances .....	32	Customs receipts .....	\$3, 080. 22

The following statement concerning the commerce of the Pascagoula River for the calendar year ending December 31, 1906, was furnished by the Pascagoula Commercial Club, of Scranton, Miss.:

Articles.	Quantity.	Value.
<b>Arriving:</b>	<i>Tons.</i>	
Logs and timber .....	261, 758	\$1, 780, 000
Fish and oysters .....	1, 337	50, 000
Miscellaneous .....	3, 000	150, 000
Total .....	266, 095	1, 980, 000
<b>Departing:</b>		
Lumber and timber .....	438, 271	3, 805, 964
Rosin .....	6, 625	100, 000
Turpentine .....	1, 680	280, 000
Charcoal .....	18, 000	100, 000
Total .....	464, 576	4, 285, 964

### R 6.

#### IMPROVEMENT OF PASCAGOULA, LEAF, AND CHICKASAHAY RIVERS, MISSISSIPPI.

##### (A) PASCAGOULA RIVER.

The entire length of this river from Moss Point to the junction of the Leaf and Chickasahay rivers was worked over upstream in June and July, 1906. The storm of September, 1906, brought in many new obstructions, some of which were removed during November and December, 1906. Expenditures during the year amounted to \$1,706.04, and have been applied to snagging in accordance with the project, which is for maintenance only.

With available funds it is proposed to continue snagging operations with present plant and to apply part of the funds to the construction of a suitable self-propelling snag boat, the only plant now available for the work being a very small quarter boat.

##### (B) LEAF RIVER.

In August, September, and October, 1906, about 116½ miles of river were worked over, counting both upstream and downstream work.

The expenditures during the year amounted to \$1,772.02, and were applied to maintenance of the channel by the removal of snags, logs, and overhanging trees.

With available funds the work of maintenance will be continued.

(C) CHICKASAHAY RIVER.

No work has been done here during the past year, as the available plant was fully occupied in snagging on the Pascagoula and Leaf rivers. No expenditures were made, but a party is now being organized and preparations made to commence snagging operations as soon as the stage of water will permit. It is proposed to clean out the river from its mouth up to the railroad bridge at Bucatunna, Miss., 75 miles.

*Money statements.*

PASCAGOULA RIVER, MISS.

July 1, 1906, balance unexpended.....	\$5,437.90
Amount appropriated by river and harbor act approved March 2, 1907.....	6,000.00
	<hr/>
	11,437.90
June 30, 1907, amount expended during fiscal year, for maintenance of improvement.....	1,706.04
	<hr/>
July 1, 1907, balance unexpended.....	9,731.86
	<hr/>
{ Amount that can be profitably expended in fiscal year ending June 30, 1909, for maintenance of improvement, in addition to the balance unexpended July 1, 1907.....	5,000.00
{ Submitted in compliance with requirements of sundry civil act of June 4, 1897, and of section 7 of the river and harbor act of 1899.	

LEAF RIVER.

July 1, 1906, balance unexpended.....	\$2,813.51
Amount appropriated by river and harbor act approved March 2, 1907.....	2,500.00
	<hr/>
	5,313.51
June 30, 1907, amount expended during fiscal year, for maintenance of improvement.....	1,772.02
	<hr/>
July 1, 1907, balance unexpended.....	3,541.49
	<hr/>
{ Amount that can be profitably expended in fiscal year ending June 30, 1909, for maintenance of improvement, in addition to the balance unexpended July 1, 1907.....	5,000.00
{ Submitted in compliance with requirements of sundry civil act of June 4, 1897, and of section 7 of the river and harbor act of 1899.	

CHICKASAHAY RIVER.

July 1, 1906, balance unexpended.....	\$2,000.00
Amount appropriated by river and harbor act approved March 2, 1907.....	1,500.00
	<hr/>
July 1, 1907, balance unexpended.....	3,500.00
July 1, 1907, outstanding liabilities.....	190.00
	<hr/>
July 1, 1907, balance available.....	3,810.00
	<hr/>
{ Amount that can be profitably expended in fiscal year ending June 30, 1909, for maintenance of improvement, in addition to the balance unexpended July 1, 1907.....	5,000.00
{ Submitted in compliance with requirements of sundry civil act of June 4, 1897, and of section 7 of the river and harbor act of 1899.	



## APPROPRIATIONS.

*For Pascagoula River.*

March 3, 1881 .....	\$4,000	June 3, 1896 .....	\$4,800
August 2, 1882 .....	8,000	June 13, 1902 (allotment) .....	4,000
July 5, 1884 .....	3,000	March 3, 1905 (allotment) .....	6,750
September 19, 1890 .....	\$2,000	March 2, 1907 (allotment) .....	6,000
July 13, 1892 .....	\$3,800		
August 18, 1894 .....	\$5,400	Total .....	47,750

*For Leaf River.*

September 19, 1890 .....	\$5,000	June 13, 1902 (allotment) .....	\$2,250
July 13, 1892 .....	5,000	March 3, 1905 (allotment) .....	3,250
August 18, 1894 .....	2,500	March 2, 1907 (allotment) .....	2,500
June 3, 1896 .....	2,500		
March 3, 1899 .....	2,500	Total .....	25,500

*For Chickasahay River.*

September 19, 1890 .....	\$5,000	June 13, 1902 (allotment) .....	\$2,250
July 13, 1892 .....	5,000	March 3, 1905 (allotment) .....	2,000
August 18, 1894 .....	5,000	March 2, 1907 (allotment) .....	1,500
June 3, 1896 .....	2,000		
March 3, 1899 .....	2,500	Total .....	25,250

## COMMERCIAL STATISTICS.

The following statement concerning the commerce of the Pascagoula River and its tributaries, the Leaf and Chickasahay rivers, for the calendar year ending December 31, 1905, was furnished by the Pascagoula Commercial Club, of Scranton, Miss.:

Articles.	Quantity.	Value,
<b>Pascagoula River:</b>	<i>Tons.</i>	
Logs, piling, lumber, etc. ....	238,500	\$2,567,500
Turpentine .....	1,600	278,600
Rosin .....	5,000	187,500
Charcoal .....	10,000	100,000
General merchandise .....	5,000	225,000
Total .....	260,100	3,328,600
<b>Leaf River:</b>		
Round logs .....	168,750	1,125,000
Sawn timber .....	9,000	96,000
General merchandise .....	50	2,250
Total .....	177,800	1,223,250
<b>Chickasahay River:</b>		
Logs and timber .....	168,125	1,188,000
General merchandise .....	200	9,000
Total .....	168,325	1,197,000

NOTE.—The tonnages of the Leaf and Chickasahay rivers pass down the Pascagoula River, but in the above statements the business originating on each stream is included alone.

\* Portions of the Pascagoula River appropriations applied to snagging work.

## R 7.

## IMPROVEMENT OF HORN ISLAND PASS, MISSISSIPPI.

This work was advertised in May, 1905, but no bids were received. The U. S. dredge *Charleston* was borrowed from the Charleston district, and after being repaired at the Pensacola Navy-Yard, reported at Horn Island Pass, Mississippi, on August 15, 1906. The total yardage dredged during the year is 353,230, and the condition of the pass is as follows:

*Inner cut.*

	Feet.
Mean low-water draft.....	21
Minimum width over 21 feet deep.....	60
Minimum width over 20 feet deep.....	125

*Outer bar.*

Mean low-water draft.....	22
Minimum width over 21 feet deep.....	200
Minimum width over 20 feet deep.....	300

*Money statement.*

July 1, 1906, balance unexpended.....	\$40, 374. 54
Amount appropriated by river and harbor act approved March 2, 1907.....	9, 000. 00
	49, 374. 54
June 30, 1907, amount expended during fiscal year, for works of improvement.....	29, 592. 21
July 1, 1907, balance unexpended.....	19, 782. 33
July 1, 1907, outstanding liabilities.....	2, 800. 00
July 1, 1907, balance available.....	16, 982. 33
{ Amount that can be profitably expended in fiscal year ending June 30, 1909, for maintenance of improvement, in addition to the balance unexpended July 1, 1907.....	
Submitted in compliance with requirements of sundry civil act of June 4, 1897, and of section 7 of the river and harbor act of 1899.	
	9, 000. 00

## APPROPRIATIONS.

August 18, 1894, and June 3, 1896 (allotments).....	\$7, 682. 40
March 3, 1899 (allotment, Horn Island anchorage).....	20, 000. 00
June 6, 1900 (allotment, Horn Island anchorage).....	68, 000. 00
March 3, 1905.....	40, 480. 00
March 2, 1907.....	9, 000. 00
Total .....	145, 162. 40

## COMMERCIAL STATISTICS.

During the calendar year 1906 about 352 vessels with cargoes passed through Horn Island Pass. The cargoes consisted of about 185,044 tons of lumber and timber, valued at \$1,444,840.

## R 8.

## IMPROVEMENT OF HARBOR AT BILOXI, MISSISSIPPI.

Under a contract dated August 4, 1906, with the Home Dredging Company, of Mobile, Ala., maintenance dredging was commenced in Biloxi Harbor on September 12, 1906, and was suspended on September 26, 1906, on account of the near exhaustion of funds. During this time 27,139.3 cubic yards of material, place measurement, were removed from the channel, resulting in a cut 50 feet wide and 8 feet deep, reaching from the wharves at Biloxi to near the outer end of the channel, 4,134 feet. Dredging will be resumed at this place during the approaching fiscal year with the funds appropriated for the purpose by the river and harbor act of March 2, 1907.

*Money statement.*

July 1, 1906, balance unexpended.....	\$8,845.50
Amount appropriated by river and harbor act approved March 2, 1907.....	9,000.00
	<hr/> 17,845.50
June 30, 1907, amount expended during fiscal year, for maintenance of improvement.....	7,148.97
	<hr/> 10,696.53
{ Amount that can be profitably expended in fiscal year ending June 30, 1909, for maintenance of improvement, in addition to the balance unexpended July 1, 1907.....	10,000.00
{ Submitted in compliance with requirements of sundry civil act of June 4, 1897, and of section 7 of the river and harbor act of 1899.	

## APPROPRIATIONS.

August 2, 1882.....	\$5,000.00
August 5, 1886.....	12,500.00
August 11, 1888.....	18,500.00
September 19, 1890.....	9,000.00
June 13, 1902.....	10,000.00
March 3, 1905.....	9,000.00
March 2, 1907.....	9,000.00
	<hr/> 73,000.00
Total .....	73,000.00
Less amount turned back into Treasury January, 1896.....	617.73
	<hr/> 72,382.27
Balance .....	72,382.27

## CONTRACTS IN FORCE.

With Home Dredging Company, dated August 4, 1906, approved by the Chief of Engineers August 16, 1906, for dredging in harbor at Biloxi, Miss., at the rate of 25½ cents per cubic yard for material removed by the hydraulic process, measured in place. Work commenced September 12 and was completed September 26, 1906.

# 1392 REPORT OF THE CHIEF OF ENGINEERS, U. S. ARMY.

COMMERCIAL STATISTICS FOR THE CALENDAR YEAR ENDING DECEMBER 31, 1906.

## Exports and imports.

Articles.	Quantity.	Value.
<b>Exports:</b>	<i>Tons.</i>	
Sand.....	2,000	\$4,000
Turpentine.....	1,368	284,000
Rosin.....	7,800	187,200
Lumber.....	13,500	120,000
<b>Total.....</b>	<b>24,668</b>	<b>545,200</b>
<b>Imports:</b>		
General merchandise.....	20,000	1,000,000
Building material.....	766	23,250
Fruit and vegetables.....	3,080	128,250
Sash, doors, shingles, and dressed lumber.....	4,500	140,000
Coal.....	12,600	87,800
Cement.....	1,000	12,000
Wood.....	800	2,000
Fish and oysters.....	10,000	600,000
<b>Total.....</b>	<b>52,746</b>	<b>1,988,300</b>

## R 9.

### CHANNEL FROM GULFPORT TO SHIP ISLAND HARBOR, MISSISSIPPI.

During the past fiscal year a survey party has been almost continuously engaged in sounding to determine whether the channel and basin were being maintained, and incidentally to determine the rate of shoaling. The dredge engaged on this contract resumed work August 3, 1906, and continued until April 26, 1907.

The condition of the channels leading to Gulfport is as follows:

#### *Gulfport anchorage basin and ship channel.*

	Feet.
Mean low water draft.....	21
Minimum depth in channel.....	18
Maximum depth in channel.....	26½
Width of channel.....	300
Depth in center of channel.....	20½-26½

#### *Ship Island anchorage and pass.*

Minimum depth from end of Gulfport channel to Ship Island Pass.....	19
Depth in anchorage (approximate).....	30
Depth over bar (width about 300 feet).....	22½

Expenditures in connection with survey and supervision of this work during the fiscal year have amounted to \$5,848.24. No expenditures have been made for maintenance under contract.

*Statement of expenditures for examinations and inspections of work of dredging a channel and anchorage basin between Ship Island Harbor and Gulfport, Miss., during the fiscal year ending June 30, 1907.*

[Submitted in accordance with Circular 12, Office of the Chief of Engineers, dated July 31, 1897.]

Items.	Allotted.	Expended.	Balance.
Inspection and superintendence.....	\$5,070.00	\$4,382.78	\$787.22
Examinations and surveys.....	1,200.00	1,074.97	125.03
Office expenses.....	1,250.00	405.00	845.00
Mileage.....	150.00	30.24	119.76
Incidentals.....	380.00	5.30	324.70
<b>Total.....</b>	<b>8,000.00</b>	<b>5,848.24</b>	<b>2,151.76</b>

*Money statement.*

July 1, 1906, balance unexpended.....	\$14, 094. 19
June 30, 1907, amount allotted during fiscal year.....	3, 005. 81
Amount appropriated by river and harbor act approved March 2, 1907.....	100, 000. 00
Amount appropriated by sundry civil act approved March 4, 1907....	10, 000. 00
	<hr/>
June 30, 1907, amount expended during fiscal year, for maintenance of improvement .....	128, 000. 00
	5, 848. 24
July 1, 1907, balance unexpended.....	<hr/>
July 1, 1907, outstanding liabilities.....	122, 151. 76
	400. 00
July 1, 1907, balance available.....	<hr/>
	121, 751. 76
<hr/>	
{ Amount that can be profitably expended in fiscal year ending June 30, 1909, for maintenance of improvement, in addition to the bal- ance unexpended July 1, 1907.....	200, 000. 00
{ Submitted in compliance with requirements of sundry civil act of June 4, 1897, and of section 7 of the river and harbor act of 1899.	

## APPROPRIATIONS.

July 5, 1884, (allotments).....	\$24, 199. 85
June 28, 1902.....	150, 000. 00
April 28, 1904 (maintenance).....	10, 000. 00
March 2, 1907.....	100, 000. 00
March 4, 1907 (maintenance).....	10, 000. 00
Total .....	<hr/>
	294, 199. 85

## CONTRACT IN FORCE.

With Spencer S. Bullis, dated February 20, 1901, approved by the Chief of Engineers March 18, 1901, for dredging a channel and anchorage basin in Mississippi Sound, between Ship Island Harbor and Gulfport, Miss., for \$150,000, and for maintaining said channel and anchorage basin for a period of five years after its completion for the sum of \$10,000 annually. Work commenced April 18, 1901, and the channel and anchorage basin were accepted as completed June 14, 1906. The five-year period of maintenance commenced June 14, 1906, but this contract was finally annulled under supplemental agreement approved by the Secretary of War June 11, 1907.

## COMMERCIAL STATISTICS FOR THE CALENDAR YEAR ENDING DECEMBER 31, 1906.

*Exports and imports.*

Articles.	Quantity.	Value.
<b>Exports:</b>	<b>Tons.</b>	
Lumber and timber.....	659, 581	\$8, 224, 000
Naval stores.....	20, 531	558, 621
Total.....	<hr/>	<hr/>
	680, 062	8, 777, 621
<b>Imports:</b>		
Lumber and timber (coastwise) .....	60, 750	540, 000
Phosphate, pyrites, asphaltum, creosote oil .....	8, 180	57, 244
Total.....	<hr/>	<hr/>
	68, 930	597, 244

# 1394 REPORT OF THE CHIEF OF ENGINEERS, U. S. ARMY.

*Comparative statement of number and draft of vessels passing in and out of the dredged channel for calendar years 1905 and 1906.*

[Compiled from records of custom-house and wharfmaster.]

	Steamships.				Square-rigged vessels.				Schooners.				Total.			
	In.		Out.		In.		Out.		In.		Out.		In.		Out.	
	1905.	1906.	1905.	1906.	1905.	1906.	1905.	1906.	1905.	1906.	1905.	1906.	1905.	1906.	1905.	1906.
Less than 14 feet.	89	111	2	1	76	64	.....	3	71	55	9	26	236	230	11	30
14 to 15 feet .....			6	1				3			29	25			35	29
15 to 16 feet .....			5	2			5	2			25	11			35	15
16 to 17 feet .....		3	3	5			7	8			14	8		8	24	21
17 to 18 feet .....	3		4	4			18	8	1		9	2		4	31	14
18 to 19 feet .....		1	5	13	1		8	13		1	2	3	1	14	28	
19 to 20 feet .....			22	23			17	17	1		2		1	41	40	
20 to 21 feet .....	3	1	20	37			17	17					3	1	37	54
21 to 22 feet .....	1	1	12	16			4	6					1		16	22
22 to 23 feet .....			5	1									1	5	1	
Total.....	96	117	84	103	77	64	76	77	75	55	89	74	248	236	249	254

## R 10.

### IMPROVEMENT OF WOLF AND JORDAN RIVERS, MISSISSIPPI.

With the funds available it is proposed to enter into contract during the next fiscal year for dredging a channel 7 feet deep, 100 feet wide at bottom, and with side slopes of 1 on 6, from the 7-foot depth in each stream to the 6-foot curve of depth in Bay St. Louis.

No expenditures were made during the past fiscal year.

#### Money statement.

Amount appropriated by river and harbor act approved March 2, 1907 .....	\$30,000.00
July 1, 1907, balance unexpended .....	30,000.00
<hr/>	
{ Amount that can be profitably expended in fiscal year ending June 30, 1909, for maintenance of improvement, in addition to the balance unexpended July 1, 1907 .....	5,000.00
{ Submitted in compliance with requirements of sundry civil act of June 4, 1897, and of section 7 of the river and harbor act of 1899.	

#### APPROPRIATION.

March 2, 1907..... \$30,000

#### COMMERCIAL STATISTICS FOR THE CALENDAR YEAR ENDING DECEMBER 31, 1906.

Articles.	Quantity.	Value.
	<i>Tons.</i>	
Lumber.....	41,062	\$327,389
Rosin .....	7,285	195,373
Turpentine .....	1,765	255,142
General merchandise.....	3,753	168,956
Total.....	53,865	946,860

## R II.

## IMPROVEMENT OF PEARL RIVER BELOW ROCKPORT, MISSISSIPPI.

The present project is for a 2-foot channel at mean low water from the mouth up to Rockport, Miss., 246 miles. The project has never been completed. The entire distance has been worked over once, and some sections have been cleaned out several times. The continuous operation of a suitable self-propelling snag boat for five years is believed to be necessary to complete the improvement.

Between June 22 and December 31, 1906, about 86 miles of the river were worked over and obstructions removed therefrom. The present snag boat *Pearl* is simply a stream capstan derrick boat, without propelling power. The hull of this boat was found to be in need of extensive repairs, and during March, April, and May, 1907, these were made. Snagging operations will be resumed with this boat early in July.

With available funds it is proposed to continue the work of improvement and maintenance with the present plant, and to apply part of the funds to the construction of a self-propelling snag boat.

*Money statement.*

July 1, 1906, balance unexpended.....	\$4,494.17
Amount appropriated by river and harbor act approved March 2, 1907.....	30,000.00
	<hr/>
	34,494.17
June 30, 1907, amount expended during fiscal year, for maintenance of improvement.....	5,311.85
	<hr/>
July 1, 1907, balance unexpended.....	29,182.32
July 1, 1907, outstanding liabilities.....	80.00
	<hr/>
July 1, 1907, balance available.....	29,102.32
	<hr/>
Amount (estimated) required for completion of existing project.....	<sup>a</sup> 80,000.00
	<hr/>
{ Amount that can be profitably expended in fiscal year ending June 30, 1909, for works of improvement, in addition to the balance unexpended July 1, 1907.....	20,000.00
{ Submitted in compliance with requirements of sundry civil act of June 4, 1897.	

## APPROPRIATIONS.

June 14, 1880.....	\$30,000.00	June 3, 1896.....	\$10,000.00
March 3, 1881.....	25,000.00	March 3, 1899.....	7,000.00
August 2, 1882.....	15,000.00	June 13, 1902.....	7,000.00
July 5, 1884.....	10,000.00	June 13, 1902 (allotment).....	1,286.39
August 5, 1886.....	13,125.00	March 3, 1905.....	7,000.00
August 11, 1888.....	10,000.00	March 2, 1907.....	30,000.00
September 19, 1890.....	15,000.00		
July 13, 1892.....	15,000.00		
August 18, 1894.....	5,000.00	Total.....	200,411.39

<sup>a</sup> Assuming that revised estimate printed in House Document No. 183, Fifty-ninth Congress, second session, for completing this project has been adopted, and that \$10,000 of amount appropriated in river and harbor act approved March 2, 1907, will be applied to maintenance dredging at mouth of East Pearl River.

## COMMERCIAL STATISTICS.

Articles.	Quantity.	Value.
	<i>Tons.</i>	
Timber .....	52,612	\$466,779
Roan .....	7,018	135,881
Turpentine .....	1,668	236,220
General merchandise .....	2,222	100,000
Total .....	63,420	900,880

## R 12.

## IMPROVEMENT OF PEARL RIVER BETWEEN EDINBURG AND JACKSON, MISSISSIPPI.

During the past year, between June 27 and December 23, 1906, about 70 miles of river were worked over from Edinburg downstream. With available funds it is proposed to continue the work of removing logs and snags from the stream and cutting away overhanging trees. During the past year \$2,723.19 was expended, all applied to maintenance.

*Money statement.*

July 1, 1906, balance unexpended .....	\$3,957.90
Amount appropriated by river and harbor act approved March 2, 1907 .....	8,500.00
	<hr/> 7,457.90
June 30, 1907, amount expended during fiscal year, for maintenance of improvement .....	2,723.19
July 1, 1907, balance unexpended .....	2,734.71
July 1, 1907, outstanding liabilities .....	150.00
July 1, 1907, balance available .....	<hr/> 4,584.71
<div> <div> Amount that can be profitably expended in fiscal year ending June 30, 1909, for maintenance of improvement, in addition to the balance unexpended July 1, 1907..... </div> <div> Submitted in compliance with requirements of sundry civil act of June 4, 1897, and of section 7 of the river and harbor act of 1899. </div> </div>	
	3,500.00

## APPROPRIATIONS.

## CAETHAGE TO JACKSON.

March 3, 1879 .....	\$6,000	July 13, 1892 .....	\$5,000
June 14, 1880 .....	7,500	August 18, 1894 .....	2,400
March 3, 1881 .....	2,500	June 3, 1896 .....	2,400
August 2, 1882 .....	2,500	March 3, 1899 .....	2,500
August 6, 1886 .....	2,250		
August 11, 1888 .....	2,500	Total .....	38,550
September 19, 1890 .....	3,000		

## EDINBURG TO CAETHAGE.

July 5, 1884 .....	\$2,500	August 18, 1894 (maintenance) ..	\$500
August 5, 1886 .....	2,250	June 3, 1896 (maintenance) .....	500
August 11, 1888 .....	5,000	March 3, 1899 (maintenance) ..	1,000
September 19, 1890 .....	5,000		
July 13, 1892 (maintenance) .....	500	Total .....	17,250



## EDINBURG TO JACKSON.

June 13, 1902 .....	\$3, 000
March 3, 1905 .....	4, 000
March 2, 1907 .....	3, 500
Total .....	10, 500

## COMMERCIAL STATISTICS.

Articles.	Quantity.	Value.
	<i>Tons.</i>	
Cotton, cottonseed, and general merchandise .....	200	\$17, 130. 00
Groceries, fertilizer, and manufactured goods .....	225	10, 125. 00
Total .....	425	27, 255. 00

## R 13.

## REMOVING SUNKEN VESSELS OR CRAFT OBSTRUCTING OR ENDANGERING NAVIGATION.

Under date of May 25, 1906, an allotment of \$3,800 was made from the above-named appropriation, to be applied to the removal of the wreck of a sunken dry dock from Mobile River, Alabama. A contract has been entered into for the work, but it has not yet been performed.

## CONTRACT IN FORCE.

With Robert Middleton, dated October 2, 1906 (emergency contract), for removing sunken dry dock from Mobile River, Alabama, for the sum of \$3,700; work to be commenced by November 8, 1906, and to be completed by February 8, 1907. Time of completion has been extended.



## APPENDIX S.

### IMPROVEMENT OF THE PASSES OF THE MISSISSIPPI RIVER, OF BAYOU LAFOURCHE, OF BAYOU PLAQUEMINE, GRAND RIVER, AND PIGEON BAYOUS, AND OF BAYOU TECHE, LOUISIANA.

REPORT OF COL. E. H. RUFFNER, CORPS OF ENGINEERS, OFFICER IN  
CHARGE, FOR THE FISCAL YEAR ENDING JUNE 30, 1907.

#### IMPROVEMENTS.

- |  |  |
|--|--|
| 1. Closing crevasse in Pass a Loutre, Mississippi River.                 | 5. Bayou Lafourche, Louisiana.   |
| 2. Southwest Pass, Mississippi River.                                    | 6. Bayou Plaquemine, Grand River, and Pigeon Bayous, Louisiana.            |
| 3. Examinations and surveys at South Pass, Mississippi River.            | 7. Bayou Teche, Louisiana.   |
| 4. Maintenance and improvement of South Pass channel, Mississippi River. | 8. Removing sunken vessels or craft obstructing or endangering navigation. |

ENGINEER OFFICE, U. S. ARMY,  
*New Orleans, La., July 8, 1907.*

GENERAL: I have the honor to submit herewith annual reports upon works of river and harbor improvement for this district for the fiscal year ended June 30, 1907.

Very respectfully,

E. H. RUFFNER,  
*Colonel, Corps of Engineers.*

Brig. Gen. A. MACKENZIE,  
*Chief of Engineers, U. S. A.*

#### S I.

##### CLOSING CREVASSE IN PASS A LOUTRE, MISSISSIPPI RIVER.

For details of location, progress, and completion of a dam for closing this crevasse, see page 1487, Annual Report of the Chief of Engineers for 1898, and page 1839 of Report for 1899.

The only change in the condition of the dam during the past two years consisted in the breaking away of 85 feet which had been undermined and had been of no value as a part of the work.

A chart<sup>a</sup> herewith shows that the crevasse is gradually closing. This tendency was augmented by the effect of the mattress sill across Pass a Loutre.

No work toward closing the crevasse was attempted during the past year, the amount available being insufficient for the purpose.

<sup>a</sup> Not printed.

Specifications for constructing sill across "Cubit's gap" and "the Jump," and placing additional mattresses on and building up the sill across the head of Pass a Loutre, Mississippi River, were approved by the Chief of Engineers May 17, 1907. The Secretary of War authorized, May 25, 1907, the use of the balance remaining from the appropriation of February 26, 1897, for "closing crevasse in Pass a Loutre, Mississippi River," \$21,029.92, toward the construction of the sill contemplated by the above-named specifications, the balance of the expenses of the work to be paid from the appropriation for improving Southwest Pass, Mississippi River. Bids will be opened for this work July 6, 1907.

*Money statement.*

July 1, 1906, balance unexpended.....	\$21, 029. 92
July 1, 1907, balance unexpended.....	21, 029. 92

APPROPRIATIONS.

By act of Congress approved February 26, 1897.....	" \$250, 000
Amount received from sale of Government property.....	25
Total .....	250, 025

S 2.

IMPROVEMENT OF SOUTHWEST PASS, MISSISSIPPI RIVER.

For progress of the work, see pages 1882, 1431, and 1296, Annual Reports of the Chief of Engineers for 1904, 1905, and 1906, respectively.

During the fiscal year ending June 30, 1907, 23,097½ square yards of mattress, held in place by 6,144.73 tons of stone, was placed in the east jetty; also, 17,369.02 tons of stone as foundation for concrete, and 22,905.1 cubic yards of concrete.

During the same period 54,976½ square yards of mattress, held in place by 13,365.27 tons of stone, 24,148.25 tons of stone as foundation for concrete, and 1,344.86 cubic yards of concrete, were placed in the west jetty.

The following is a tabulated statement of the work done from December 31, 1903, the date of commencement, to June 30, 1907:

Location.	Square yards of mattress.	Tons of stone on mattresses.	Tons of stone as founda- tion for concrete.	Cubic yards of concrete.	Yards of burlap.	Number of sacks.
East jetty .....	613, 674.4	144, 800. 54	47, 097. 61	22, 905. 10	12, 428	61
West jetty .....	448, 482	87, 063. 77	41, 236. 11	1, 344. 86	456	.....
Total.....	1, 062, 156.4	231, 864. 31	88, 333. 72	24, 249. 96	12, 884	61

Progress chart accompanying this report furnishes concise information of the work done during the year and since it was commenced.

\* Of this amount \$10,000 was allotted by act of February 17, 1898, for survey of Southwest Pass, Mississippi River.

A total of \$583,704.68 was expended during the fiscal year in connection with jetty construction.

*Dredging.*—The following extract from the report of Mr. Cornelius Donovan, assistant engineer, gives a complete résumé of the dredging operations during the fiscal year:

During the fiscal year 78,073½ square yards of mattress, 61,027.27 tons of stone, and 24,249.96 cubic yards of concrete were placed in the jetties. The mattress work for the west jetty is completed, as is also that of the east jetty as far as station 21000, at which point the concrete will end. Beyond this point, and as a protection to the sea end, 20,000 square yards of mattress are yet to be placed.

The concrete capping on the east jetty is completed from station 5605 to station 18939, a distance of 13,334 feet, and on the west jetty it begins at station 2963, and 1,176 linear feet is completed, but it is not continuous. The capping was omitted from the first 5,606 feet of the east jetty and 2,963 feet of the west jetty, as it was considered unnecessary, because, as was believed would be the case, a rapid shoaling has taken place on both sides of both jetties and rendered the capping unnecessary.

The tabulated statement submitted shows the total work done in constructing the jetties, and the progress chart accompanying this report gives, in concise form, the work done during the year and since they were commenced.

The contractors earned during the year \$467,704.15, and to June 30, 1907, a total of \$2,454,094.46.

*Subsidence of the jetties.*—Since placing the concrete capping on the east jetty, September 13, 1906, to date, there has been an average settlement of nine-tenths of a foot, the greatest settlement being 1.8 feet, and the least 0.2 of a foot, except at two places, as follows: At station 7000 it settled 12½ feet for a distance of 36 feet, and at station 7400 it settled 4 feet for a distance of 24 feet. The settlement at these places was sudden and rapid. For several months there has been no further settlement. At these points very soft places, which might be termed air holes, were found when the mattresses were placed. The sinking, however, is not at all a serious matter.

The settlement of the west jetty, since the stone for foundation under concrete was placed, averages 0.05 of a foot.

There has been a deposit of sediment on the sea side of both jetties sufficient to reduce the depth of water to zero at mean low water and, in consequence, there is no leakage through the superstructure at that level.

There has also been a deposit along the channel side of both jetties, out to station 11000 east jetty, and 6000 west jetty. This was confidently relied upon to take place. It will continue, and eventually a channel of uniform depth and width will result.

This added weight on both sides of the jetties influences their settlement to a considerable degree, but taken all in all, the settlement has been much less than expected.

*Dredging.*—The dredge *Benyaurd* has operated in Southwest Pass since July 14, 1906, except for fifteen days when it worked in South Pass. On January 5, 1907, it began working with a crew of sufficient number to permit of working sixteen hours per day.

This dredge is doing excellent work. During the month of May, 1907, dredging was done on twenty-two days, and 199,056 cubic yards of material was removed at a cost of 4.7 cents per cubic yard.

The dredge *Barnard*, a pipe-line dredge, worked, without her pipe line, in the channel during the high river. The dredged material was discharged overboard, and much of it was carried out by the strong current, and thus the work of this dredge largely aided the development of a channel sufficiently deep to permit the larger dredge *Benyaurd* to operate, at first taking light loads. The *Benyaurd* draws 11 feet light and 18 feet loaded.

The dredge *General Abbot* operated in Southwest Pass during the month of January and a part of February and then returned to South Pass to do necessary work there.

*Channel development.*—Before the river began to rise in December the mattress superstructure of the jetties was sufficiently advanced to largely confine the water flowing between them, increasing the eroding power of the current. The dredges had previously marked the course of the desired channel, and both agents seemed to work in harmony to the end that the resultant channel development during the present high river was even greater than expected.

A chart of the entire channel, herewith, will be found of special interest. In June, 1906, the distance from 35 feet in depth in the pass to the same depth in the Gulf was 34,000 feet, and at the present time this distance is 22,500 feet. This means that for more than one-third of the distance over which the depth of water was less than 35 feet one year ago there is now 35 feet or more.

A total of \$137,711.34 was expended during the past fiscal year for operation of dredges on this improvement, and \$65,114.88 were expended for office expenses, engineering contingencies, and repairs to plant.

Plans and specifications for constructing sill across "Cubits Gap" and "The Jump" and placing additional mattresses on and building up the sill across the head of Pass a Loutre, Mississippi River, were approved May 17, 1907. The work was advertised May 21, 1907, bids to be opened July 6, 1907.

Specifications for dredging 15,000 feet of the channel at the mouth of Southwest Pass, to secure a depth of 35 feet at mean low tide, for a width of 500 feet, involving the removal of about 2,400,000 cubic yards of material, were submitted to the Department May 14, 1907. These specifications had not been approved to the end of the fiscal year.

For commercial statistics for the port of New Orleans see report on "Maintenance of South Pass channel, Mississippi River."

#### *Money statement.*

July 1, 1906, balance unexpended.....	\$1,096,517.30
Amount appropriated by river and harbor act approved March 2, 1907.....	1,000,000.00
	<u>2,096,517.30</u>
June 30, 1907, amount expended during fiscal year, for works of improvement.....	736,530.90
July 1, 1907, balance unexpended.....	1,359,986.40
July 1, 1907, outstanding liabilities.....	106,660.57
	<u>1,253,325.83</u>
July 1, 1907, balance available.....	197,583.46
July 1, 1907, amount covered by uncompleted contracts.....	<u>1,500,000.00</u>
Amount (estimated) required for completion of existing project.....	<u>1,500,000.00</u>
<div style="display: flex; align-items: center;"> <div style="font-size: 3em; margin-right: 10px;">{</div> <div>           Amount that can be profitably expended in fiscal year ending June 30, 1909, in addition to the balance unexpended July 1, 1907, for works of improvement.....         </div> <div style="margin-left: 20px; text-align: right;">1,500,000.00</div> </div>	
<div style="display: flex; align-items: center;"> <div style="font-size: 3em; margin-right: 10px;">{</div> <div>           Submitted in compliance with requirements of sundry civil act of June 4, 1897, and of section 7 of the river and harbor act of 1899.         </div> </div>	

#### APPROPRIATIONS.

June 13, 1902.....	\$750,000.00
March 3, 1903.....	1,000,000.00
March 3, 1905.....	1,250,000.00
June 30, 1906.....	500,000.00
March 2, 1907.....	1,000,000.00
	<u>4,500,000.00</u>
Miscellaneous receipts deposited to credit of the appropriation....	944.74
	<u>4,500,944.74</u>
Transferred to appropriation for maintenance of South Pass channel, Mississippi River, 1906.....	23,305.33
	<u>4,477,639.41</u>

\* Balance unexpended, \$1,096,487.34, as shown by Annual Report for 1906, is in error. Should have been \$1,096,517.30.

*E. H. Ruffner*

Col. Corps of Engineers, U.S.A.

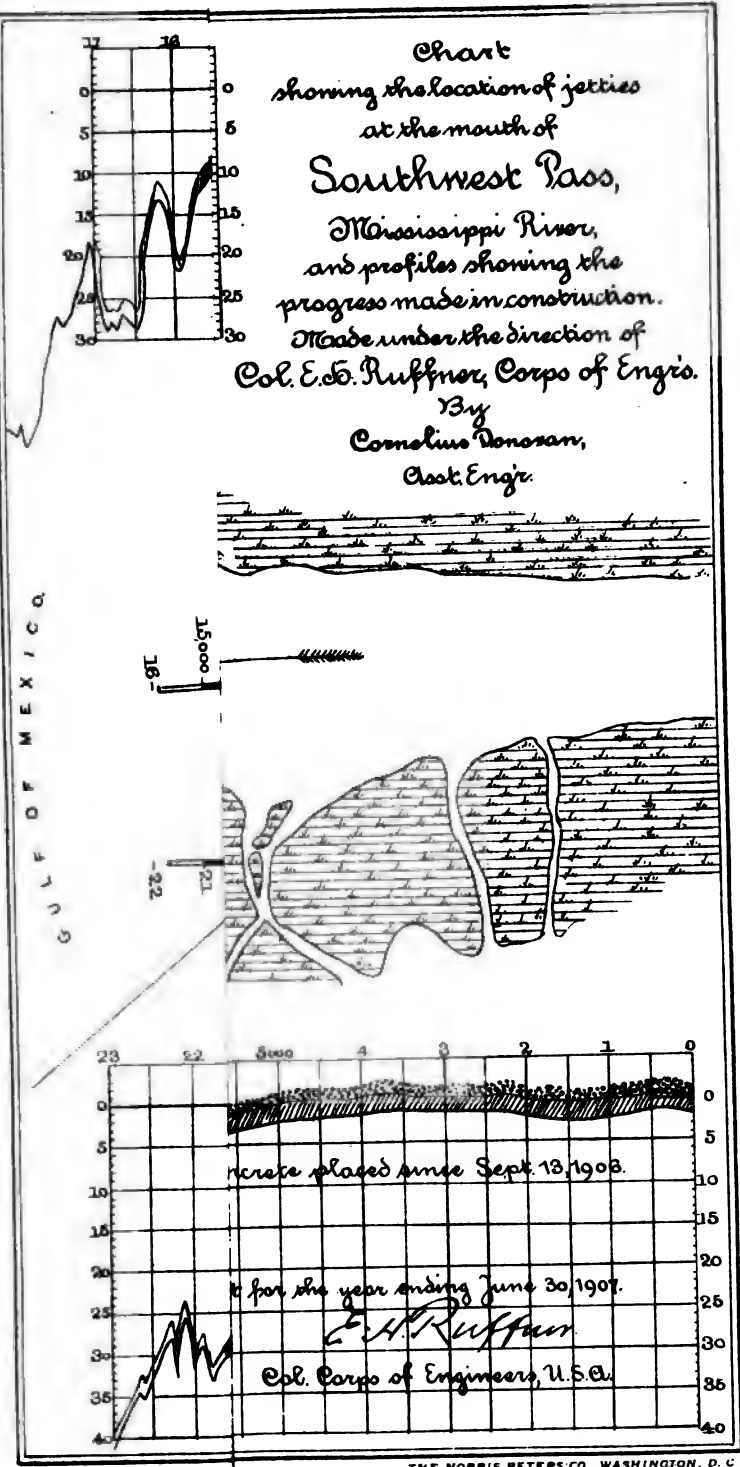
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J. L. Dick

THE MORRIS PETERS CO., WASHINGTON, D. C.









## CONTRACTS IN FORCE.

## I.

Name and address of contractor: Christie & Lowe, Chicago, Ill.

Work: Constructing two jetties at the mouth of Southwest Pass, Mississippi River. As modified by supplemental contract dated July 18, 1905, approved by the Secretary of War July 31, 1905, includes the following estimated quantities of materials: Brush mattress, 1,094,993 square yards; riprap stone, 322,075 tons; concrete, 49,343 cubic yards.

Contract price: Brush mattress, 96 cents per square yard; riprap stone, \$4 per ton; concrete, \$6.10 per cubic yard.

Date of contract: July 16, 1903.

Date of approval: July 31, 1903.

Date of commencement: October 2, 1903.

Date of expiration: August 3, 1907.

## II.

Name and address of contractor: Schwartz Foundry Company, New Orleans, La.

Work: Furnishing labor and material and making repairs to U. S. dredge *Benyaurd*.

*Contract price.*

A. Making one new rudder, etc.....	\$3,799.50
B. Making four new pintels and nuts.....	140.00
C. Taking off propellers, both port and starboard, and replacing them; reverse skin and stern bearings, port and starboard sides, and reconnect grease pipes to these bearings.....	265.00
D. Drawing in and replacing starboard tail shaft, test and straighten, if necessary, and patch starboard wheel.....	260.00
E. Refilling and facing 16 horseshoe collars.....	257.00

Date of contract: October 11, 1906.

Date of expiration: November 6, 1906.

Emergency contract.

## III.

Name and address of contractor: Woodward, Wight & Co. (Limited), New Orleans, La.

Object: Furnishing subsistence supplies, etc., for U. S. dredges *Benyaurd*, *Barnard*, and *General Abbot*, and U. S. tug *C. Donovan*, during a period of three months, from December 1, 1906, to March 1, 1907.

*Contract prices.*

Article.	Unit of quantity.	Unit price.
Allspice.....	Pound.....	\$0.25
Apples:		
Evaporated.....	do.....	.07
Canned, 6s.....	Dozen.....	.90
Bacon, breakfast.....	Pound.....	.1475
Barley.....	do.....	.085
Bay leaves.....	do.....	.30
Beans:		
Red kidney.....	do.....	.05125
White navy.....	do.....	.08125
Lima.....	do.....	.05625
Canned string, 2s.....	Dozen.....	.75
Boston baked, 6s.....	do.....	.85
Beef:		
Corned.....	Half barrel.....	6.00
Corned, 14s.....	Dozen.....	17.75
Blackberries, canned, 2s.....	do.....	.85
Bluing.....	Gross.....	1.20
Bread, pilot.....	Pound.....	.0525
Butter:		
Creamery.....	do.....	.30
Dairy.....	do.....	.20
Cabbage.....	do.....	.025
Catsup.....	Pint.....	.21
do.....	Gallon.....	1.10
Charcoal.....	Sack.....	1.00

## Contract prices—Continued.

Article.	Unit of quantity.	Unit price.
<b>Cheese:</b>		
American creamery .....	Pound .....	\$0.16
Italian .....	do .....	.80
Chowchow .....	Gallon .....	.78
Cinnamon .....	Pound .....	.27
Citron .....	do .....	.25
Cloves .....	do .....	.15
Cocoonut, shredded .....	do .....	.20
Codfish .....	do .....	.065
Coffee, parched .....	do .....	.15
Coke, gas .....	Sack .....	.75
Corn, canned, 2s .....	Dozen .....	.80
Crackers .....	Pound .....	.065
Cracker dust .....	do .....	.065
Cream, canned .....	Dozen .....	.875
Currants .....	Pound .....	.10
Curry powders .....	do .....	.56
Eggs .....	Dozen .....	.32
<b>Extract:</b>		
Vanilla (4-ounce) .....	Bottle .....	.19
Lemon (4-ounce) .....	do .....	.18
Vanilla (4-ounce) .....	do .....	.56
Lemon (4-ounce) .....	do .....	.33
Farina .....	Pound .....	.09
<b>Flour:</b>		
Wheat .....	Barrel .....	4.60
Buckwheat .....	Pound .....	.0675
Graham .....	do .....	.06
Garlic .....	do .....	.08
Gelatine .....	Dozen .....	1.15
Ginger .....	Pound .....	.26
Grits .....	do .....	.0175
Ham .....	do .....	1.4625
Hominy .....	do .....	.025
Jelly, 2s .....	Dozen .....	1.85
Jelly .....	Pound .....	.035
Kraut .....	Gallon .....	.32
Canned, 3s .....	Dozen .....	.85
Lard .....	Pound .....	.11
Stearine .....	do .....	.18
Lemons, 36cs .....	Box .....	4.35
Lemons .....	Dozen .....	.20
Lye, 1s .....	do .....	.75
Maccaroni .....	Pound .....	.05
Mincemeat, 2s .....	Dozen .....	1.00
Mincemeat .....	Gallon .....	.60
Mackerel, 15s .....	Kit .....	1.50
Matches .....	Gross .....	.60
Meal, corn .....	Pound .....	.0175
Milk, condensed .....	Dozen .....	1.11
Molasses .....	Gallon .....	.40
Mustard .....	Pound .....	.29
Mace .....	do .....	.35
Nutmegs, whole .....	Ounce .....	.08
Oatmeal .....	Pound .....	.045
Oil, olive .....	Quart .....	.40
Okra, 2s .....	Dozen .....	.90
Onions .....	Bushel .....	1.20
Paper, toilet .....	Roll .....	.085
Peaches, evaporated .....	Pound .....	.13
Peaches, 3s .....	Dozen .....	1.875
Pears, 3s .....	do .....	1.95
Peas, 2s .....	do .....	1.05
Green .....	Pound .....	.0275
Split .....	do .....	.0425
<b>Pepper:</b>		
Black .....	do .....	.27
Chile .....	do .....	.20
Cayenne .....	do .....	.28
Pickles .....	Gallon .....	.475
Pie fruit, 3s .....	Dozen .....	1.00
Pig's feet, pickled .....	Half barrel .....	3.20
<b>Potatoes:</b>		
Irish .....	Bushel .....	1.00
Sweet .....	do .....	1.85
Canned sweet .....	Dozen .....	.90
<b>Powder:</b>		
Baking .....	Pound .....	.40
Washing .....	do .....	.04575
Prunes .....	do .....	.0625
Pumpkin, canned .....	Dozen .....	.85
Raisins .....	Pound .....	.11
Rice .....	do .....	.0475
Sage .....	do .....	.89

## Contract prices—Continued.

Article.	Unit of quantity.	Unit price.
Sago .....	Pound .....	\$0.075
Salmon, 1s .....	Dozen .....	1.275
Salt:		
Fine .....	Pound .....	.01
Coarse .....	do .....	.005
Sapallo .....	Case .....	4.50
Sauce:		
Pepper (16-ounce) .....	Bottle .....	.18
Worcestershire .....	Pint .....	.40
Do .....	Gallon .....	.95
Shoulders, dry salt .....	Pound .....	.0065
Soap:		
Ivory or Grandpa's Wonder .....	Box .....	4.00
Octagon .....	do .....	8.80
Olive .....	do .....	2.15
Soda:		
Cooking .....	Pound .....	.06
Washing .....	do .....	.02
Spaghetti .....	do .....	.05
Starch:		
Corn .....	do .....	.0525
Laundry .....	do .....	.0875
Sugar:		
Standard granulated .....	do .....	.049
Yellow clarified .....	do .....	.046
Open kettle .....	do .....	.046
Powdered .....	do .....	.06
Tapioca .....	do .....	.075
Tea .....	do .....	.35
Thyme .....	do .....	.25
Tomatoes, 3s .....	Dozen .....	1.175
Vermicelli .....	Pound .....	.065
Vinegar .....	Gallon .....	.25
Yeast:		
Fresh .....	Pound .....	.50
Cakes .....	Package .....	.045
Flour, rye .....	Pound .....	.0875
Coffee, ground, 2s .....	do .....	.19
Flour, wheat .....	Half barrel .....	2.50
Chowchow .....	Pint .....	.29
Beef, corned .....	Barrel .....	11.00
Extracts:		
Vanilla .....	Pint .....	.70
Lemon .....	do .....	.70

Date of contract: November 28, 1906.

Date of approval: Not required; emergency contract to be paid jointly from appropriations for improving Southwest Pass, Mississippi River, and maintenance of South Pass channel, Mississippi River.

Date of expiration: March 1, 1907.

## IV.

Name and address of contractor: Ellicott Machine Company, Baltimore, Md.

Work: To furnish one steel ball and socket joint for dredge *Benyaurd* for \$560, and to furnish such additional joints as required during a period of three months for \$360 each.

Date of contract: December 12, 1906.

Emergency contract.

Work commenced as soon as signed.

Date of expiration: March 12, 1907.

## V.

Name and address of contractor: Ellicott Machine Company, Baltimore, Md.

Work: To furnish two lengths iron pipe and four steel flanges for dredge *Benyaurd*, at \$36 and \$19.75 each, respectively; also to furnish such additional pipes and flanges as required during a period of three months for \$36 each for pipes and \$18 each for flanges.

Date of contract: December 12, 1906.

Emergency contract.

Date of expiration: March 12, 1907.

## VI.

Name and address of contractor: Jos. Edwards & Co., New York, N. Y.

Work: To furnish cast-steel elbows and sleeves for the dredge *Benyaurd* for a period of one year from date of contract. Price of elbows, \$232.50 each and price of sleeves \$258 for the first sleeve and \$230 each for subsequent sleeves.

Date of contract: December 19, 1906.

Emergency contract.

Date of expiration: December 18, 1907.

## VII.

Name and address of contractor: Gulfport Creosoting Company, Gulfport, Miss.

Work: Furnishing and delivering creosoted piles and waling timbers at Southwest Pass, Mississippi River. One hundred and ten yellow-pine piles, 40 feet long; 40 yellow-pine piles, 50 feet long; 5 pieces waling timber. Prices: 40-foot piles, \$12; 50-foot piles, \$13.10; waling timbers, \$24.07.

Date of contract: December 15, 1906.

Emergency contract.

Work commenced as soon as contract was signed.

Date of expiration: January 14, 1907.

## VIII.

Name and address of contractor: W. G. Coyle & Co., New Orleans, La.

Work: Furnishing and delivering 10,000 barrels coal in bunkers of dredge *Benyaurd*, at 40½ cents per barrel, during a period of three months from date of contract.

Date of contract: January 5, 1907.

Emergency contract.

Date of commencement: January 5, 1907.

Date of expiration: April 5, 1907.

## IX.

Name and address of contractor: Whitney Supply Company (Limited), New Orleans, La.

Work: Furnishing rubber suction pipes for dredge *Benyaurd* for one year from date of contract. Price, \$300 for each length of pipe.

Date of contract: January 7, 1907.

Emergency contract.

Date of commencement: January 7, 1907.

Date of expiration: January 6, 1908.

## X.

Name and address of contractor: The Cudahy Packing Company, of Louisiana (Limited), New Orleans, La.

Work: For furnishing meat for United States dredges operating in Southwest and South Pass, Mississippi River, for a period of six months from date of contract.

## Contract prices.

Article.	Unit of quantity.	Unit price.
Beef (western):		
Hind quarters .....	100 pounds.....	\$8.25
Fore quarters .....	do .....	4.50
Sides .....	do .....	6.65
Mutton, whole carcasses .....	do .....	10.10
Veal, whole carcasses .....	do .....	7.45
Pork:		
Shoulders .....	do .....	10.10
Loins .....	do .....	12.65
Sausage:		
Bologna .....	do .....	6.00
Pork link .....	do .....	9.00
Wienerwurst .....	do .....	9.00
Tripe, pickled .....	Kit .....	.75
Spare ribs .....	Half barrel .....	7.50

Date of contract: January 7, 1907.

Emergency contract.

Date of commencement: January 7, 1907.

Date of expiration: July 6, 1907.

The cost of meat furnished under this contract is payable from the appropriations for improving Southwest Pass, Mississippi River, and maintenance of South Pass channel, Mississippi River.

#### XI.

Name and address of contractor: W. G. Coyle & Co., New Orleans, La.

Work: For furnishing and delivering such quantity of coal as may be required by the dredges operating for the improvement of Southwest Pass, Mississippi River, and maintenance of South Pass channel, Mississippi River, and chargeable to those appropriations, for a period of one year from March 5, 1907.

Contract prices: For coal delivered in Government coal yards at South or Southwest Pass, Mississippi River, 40.95 cents per barrel.

For coal delivered in bunkers of dredges at New Orleans, La., 40.45 cents per barrel.

For coal delivered on Government barges, including towing from and to South or Southwest Pass, Mississippi River, 47.45 cents per barrel.

Date of contract: February 23, 1907.

Date of approval: March 2, 1907.

Date of commencement: March 21, 1907.

Date of expiration: March 4, 1908.

#### XII.

Name and address of contractor: Woodward, Wight & Co. (Limited), New Orleans, La.

Work: Furnishing and delivering subsistence supplies, etc., to dredges and tug operating for improvement of Southwest Pass, Mississippi River, and maintenance of South Pass channel, Mississippi River, and chargeable to those appropriations, for a period of six months, from March 1 to August 31, 1907.

#### Contract prices.

Article.	Unit of quantity.	Unit price.
Allspice.....	Pound.....	\$0.26
Apples:		
Evaporated.....	do.....	.07½
Canned 3s.....	Dozen.....	.90
Bacon, breakfast.....	Pound.....	.17
Barley.....	do.....	.04
Bay leaves.....	do.....	.30
Beans:		
Red kidney.....	do.....	.04½
White navy.....	do.....	.08
Lima.....	do.....	.05½
Canned string, 2s.....	Dozen.....	.72½
Boston-baked, 3s.....	do.....	.85
Beef:		
Corned.....	Barrel.....	12.00
Do.....	Half barrel.....	6.50
Corned, 14s.....	Dozen.....	17.75
Blackberries, canned, 2s.....	do.....	.85
Bluing.....	Gross.....	1.20
Bread, Pilot.....	Pound.....	.05½
Butter:		
Creamery.....	do.....	.28
Dairy.....	do.....	.22
Cabbage.....	do.....	.02½
Catsup.....	Pint.....	.21
Do.....	Gallon.....	1.10
Charcoal.....	Sack.....	.96
Cheese:		
American creamery.....	Pound.....	.16
Italian.....	do.....	.30
Chowchow.....	Gallon.....	.70
Do.....	Pint.....	.29
Citron.....	Pound.....	.25

## Contract prices—Continued.

Article.	Unit of quantity.	Unit price.
Cinnamon .....	Pound .....	\$0.27
Cloves .....	do .....	.20
Cocoanut, shredded .....	do .....	.20
Codfish .....	do .....	.06½
Coffee:		
Parched .....	do .....	.15
Ground .....	do .....	.15½
Coke, gas .....	Sack .....	.75
Corn, canned, 2s. ....	Dozen .....	.80
Crackers .....	Pound .....	.07
Cracker dust .....	do .....	.06½
Cranberry sauce .....	do .....	.06½
Cream, canned .....	Dozen .....	.85
Currants .....	Pound .....	.09
Curry powders .....	do .....	.50
Eggs .....	Dozen .....	.21
Extract:		
Vanilla .....	Pint .....	1.00
Lemon .....	do .....	1.00
Vanilla (4-ounce) .....	Bottle .....	.56
Lemon (4-ounce) .....	do .....	.33
Flour:		
Wheat .....	Barrel .....	4.95
Do .....	Half barrel .....	2.60
Graham .....	Pound .....	.05
Buckwheat .....	do .....	.05½
Rye .....	do .....	.03½
Garlic .....	do .....	.09
Gelatine .....	Package .....	1.20
Ginger .....	Pound .....	.26
Grits .....	do .....	.01½
Ham .....	do .....	.16
Hominy .....	do .....	.02½
Jelly, 2s. ....	Dozen .....	1.85
Jelly .....	Pound .....	.08
Kraut .....	Gallon .....	.60
Canned, 3s. ....	Dozen .....	.85
Lard .....	Pound .....	.12½
Stearine .....	do .....	.18
Lemons (30 dozen) .....	Box .....	3.75
Lemons .....	Dozen .....	.20
Lye, 1s. ....	do .....	.70
Macaroni .....	Pound .....	.04½
Mincemeat, 2s. ....	Dozen .....	1.00
Mincemeat .....	Pound .....	.06½
Mackerel, 15s. ....	do .....	.13
Matches .....	Gross .....	.60
Meal, corn .....	Pound .....	.01½
Milk, condensed .....	Dozen .....	1.10
Molasses .....	Gallon .....	.45
Mustard .....	Pound .....	.29
Mace .....	do .....	.35
Nutmegs, whole .....	Ounce .....	.03
Oatmeal, 2s. ....	Dozen .....	1.05
Oil, olive .....	Quart .....	.40
Okra, 2s. ....	Dozen .....	.77½
Onions .....	Pound .....	.02½
Paper, toilet .....	Roll .....	.03½
Peaches, evaporated .....	Pound .....	.12½
Peaches, 3s. ....	Dozen .....	1.90
Pears, 3s. ....	do .....	1.90
Peas, 2s. ....	do .....	1.97½
Green .....	Pound .....	.02½
Split .....	do .....	.04½
Pepper:		
Black .....	do .....	.26
Chili .....	do .....	.20
Cayenne .....	do .....	.28
Pickles .....	Gallon .....	.47½
Pie fruit, 3s. ....	Dozen .....	1.00
Pigs' feet .....	Half barrel .....	3.60
Potatoes:		
Irish .....	Bushel .....	1.00
Sweet .....	Pound .....	.08
Canned sweet .....	Dozen .....	1.00
Powder:		
Baking .....	Pound .....	.40
Washing, 4s. ....	Dozen .....	1.12½
Prunes .....	Pound .....	.07½
Pumpkin, canned .....	Dozen .....	.35
Raisins .....	Pound .....	.08½
Rice .....	do .....	.04½



*Contract prices—Continued.*

Article.	Unit of quantity.	Unit price.
Sage .....	Pound.....	\$0.36
Sago .....	do.....	.07½
Salmon, 1s .....	Dozen.....	1.27½
Salt:		
Table .....	Pound.....	.00475
Coarse .....	do.....	.01
Sapallo .....	Box .....	4.50
Sauce:		
Pepper (16-ounce) .....	Bottle.....	.18
Worcestershire.....	Pint.....	.40
Do .....	Gallon.....	.95
Shoulders, dry salt.....	Pound.....	.09½
Soap:		
Ivory .....	Box .....	4.00
"Grand-Pa's Wonder" .....	do.....	8.90
Octagon .....	do.....	3.95
Olive.....	do.....	2.30
Soda:		
Cooking .....	Pound.....	.08
Washing .....	do.....	.02
Spaghetti .....	do.....	.04½
Starch:		
Corn .....	do.....	.05½
Laundry .....	do.....	.04
Sugar:		
Standard granulated .....	do.....	.049
Yellow clarified .....	do.....	.047
Open kettle .....	do.....	.042
Powdered.....	do.....	.06
Tapioca .....	do.....	.08
Tea .....	do.....	.35
Thyme.....	do.....	.28
Tomatoes, 3s.....	Dozen.....	1.15
Vermicelli .....	Pound.....	.06½
Vinegar .....	Gallon.....	.25
Yeast:		
Fresh .....	Pound.....	.50
Cakes .....	Box .....	.65

Less 1 per cent for deliveries f. o. b. New Orleans, La.

Date of contract: March 1, 1907.

Emergency contract.

Date of commencement: March 1, 1907.

Date of expiration: August 31, 1907.

## XIII.

Name and address of contractor: Whitney Supply Company (Limited), New Orleans, La.

Work: Furnishing and delivering rubber suction pipe for U. S. dredge *Barnard*, for \$880. The right is reserved by the United States to order another suction pipe at the same price within six months from date of contract.

Date of contract: April 9, 1907.

Emergency contract.

Date of commencement: April 17, 1907.

Date of expiration: May 12, 1907.

## XIV.

Name and address of contractor: Stern Foundry and Machinery Company, New Orleans, La.

Work: Furnishing and delivering coal chutes for use in connection with construction of coaling station at Southwest Pass, Mississippi River.

*Contract prices.*

1 coal chute of $\frac{1}{4}$ -inch sheet iron.....	\$11.30
1 coal chute of $\frac{3}{8}$ -inch sheet iron.....	33.00
2 coal chutes of $\frac{3}{8}$ -inch sheet iron, at \$13.28.....	26.56
4 coal chutes of $\frac{1}{4}$ -inch sheet iron, at \$13.....	52.00
2 coal chutes of $\frac{3}{8}$ -inch sheet iron, at \$15.50.....	31.00
	154.46

Date of contract: May 21, 1907.

Emergency contract.

Date of commencement: May 21, 1907.

Date of expiration: June 19, 1907.

## XV.

Name and address of contractor: Woodward, Wight & Co. (Limited), New Orleans, La.

Work: For furnishing and delivering bolts, nuts, washers, rope, etc., for use in connection with construction of coaling station at Southwest Pass, Mississippi River.

*Contract prices.*

Article.	Unit of quantity.	Unit price.
650 drift bolts, $\frac{1}{2}$ inch diameter by 24 inches long.....	Each.....	\$0.06
Bolts, standard, threaded 3 inches, square heads and nuts:		
4, $\frac{1}{2}$ inch diameter by 48 inches long.....	do.....	.28
5, $\frac{1}{2}$ inch diameter by 37 inches long.....	do.....	.25
9, $\frac{1}{2}$ inch diameter by 31 inches long.....	do.....	.21
8, $\frac{1}{2}$ inch diameter by 29 inches long.....	do.....	.20
50, $\frac{1}{2}$ inch diameter by 27 inches long.....	do.....	.19
4, $\frac{1}{2}$ inch diameter by 25 inches long.....	do.....	.18
50, $\frac{1}{2}$ inch diameter by 23 inches long.....	do.....	.16
20, $\frac{1}{2}$ inch diameter by 21 inches long.....	do.....	.15
60, $\frac{1}{2}$ inch diameter by 19 inches long.....	do.....	.14
8, $\frac{1}{2}$ inch diameter by 17 inches long.....	do.....	.13
30, $\frac{1}{2}$ inch diameter by 15 inches long.....	do.....	.11
42, $\frac{1}{2}$ inch diameter by 22 inches long.....	do.....	.11
24, $\frac{1}{2}$ inch diameter by 20 inches long.....	do.....	.10
350, $\frac{1}{2}$ inch diameter by 18 inches long.....	do.....	.09
24, $\frac{1}{2}$ inch diameter by 14 inches long.....	do.....	.07
30, $\frac{1}{2}$ inch diameter by 10 inches long.....	do.....	.06
Bolts, standard, threaded 3 inches, square heads and nuts, with two plate washers to each bolt:		
12, $\frac{1}{2}$ inch diameter by 14 inches long.....	do.....	.06
24, $\frac{1}{2}$ inch diameter by 12 inches long.....	do.....	.05
30, $\frac{1}{2}$ inch diameter by 6 inches long.....	do.....	.02
500 C. I. washers, for $\frac{1}{2}$ -inch bolts, about $\frac{1}{2}$ inch by 3 inches, about 300 pounds.....	Pound.....	.08
1,100 C. I. washers, for $\frac{1}{2}$ -inch bolts, about $\frac{1}{2}$ inch by 3 inches, about 600 pounds.....	do.....	.08
4 wrought-iron rods, square head and nut, threaded 4 inches, $\frac{1}{2}$ inch diameter by 12 feet long.....	Each.....	.88
5 bars round iron, $\frac{1}{2}$ inch, about 140 pounds.....	Pound.....	.024
1 bar flat iron, $\frac{1}{2}$ inch by 2 inches, about 50 pounds.....	do.....	.025
4 iron plates, 48 inches by 77 inches, No. 10, about 500 pounds.....	do.....	.035
100 nuts for $\frac{1}{2}$ -inch bolts, about 35 pounds.....	do.....	.04
10 kegs 7-inch wire nails (spikes).....	Keg.....	2.99
10 kegs 6-inch wire nails.....	do.....	2.88
1 keg 4-inch wire nails.....	do.....	2.86
1,000 feet steel wire rope, $\frac{1}{2}$ inch.....	Foot.....	.129
150 feet steel wire rope, $\frac{1}{2}$ inch.....	do.....	.0595
12 thimbles, for $\frac{1}{2}$ -inch wire rope.....	Each.....	.04
20 clamps, for $\frac{1}{2}$ -inch wire rope.....	do.....	.08
10 clamps, for $\frac{1}{2}$ -inch wire rope.....	do.....	.07

Date of contract: May 21, 1907.

Emergency contract.

Date of commencement: May 21, 1907.

Date of expiration: June 30 and July 29, 1907.

## XVI.

Name and address of contractor: The Fairbanks Co., New Orleans, La.

Work: Furnishing and delivering hoisting engine, etc., for use in connection with construction of coaling station at Southwest Pass, Mississippi River.

*Contract prices.*

Holisting engine-----	\$2,400
Derrick fittings, etc-----	.400
	2,800

Date of contract: May 29, 1907.

Emergency contract.

Date of commencement: May 29, 1907.

Date of expiration: July 28, 1907.

## XVII.

Name and address of contractor: Gulfport Creosoting Co., Gulfport, Miss.

Work: Furnishing and delivering creosoted piles, lumber, and timber for use in connection with construction of coaling station at Southwest Pass, Mississippi River.

*Contract prices.*

	Feet B. M.	Price per 1,000 feet B. M.
<b>Creosoted lumber, 14 pounds to the cubic foot:</b>		
2 pieces 12 inches by 14 inches by 12 feet.....	336	\$44.00
2 pieces 12 inches by 12 inches by 50 feet.....	1,200	54.00
12 pieces 12 inches by 12 inches by 26 feet.....	3,744	47.00
4 pieces 12 inches by 12 inches by 22 feet.....	1,056	45.00
14 pieces 12 inches by 12 inches by 20 feet.....	3,860	45.00
61 pieces 12 inches by 12 inches by 18 feet.....	13,176	45.00
2 pieces 10 inches by 12 inches by 20 feet.....	400	45.00
2 pieces 8 inches by 12 inches by 20 feet.....	320	45.00
2 pieces 8 inches by 12 inches by 18 feet.....	288	45.00
2 pieces 8 inches by 12 inches by 14 feet.....	224	45.00
2 pieces 8 inches by 12 inches by 12 feet.....	192	45.00
4 pieces 6 inches by 12 inches by 18 feet.....	432	44.00
7 pieces 6 inches by 12 inches by 14 feet.....	568	44.00
4 pieces 6 inches by 12 inches by 12 feet.....	288	44.00
2 pieces 6 inches by 12 inches by 10 feet.....	120	44.00
6 pieces 4 inches by 12 inches by 22 feet.....	528	44.00
265 pieces 4 inches by 12 inches by 15 feet.....	16,960	44.00
61 pieces 4 inches by 12 inches by 12 feet.....	2,928	44.00
2 pieces 6 inches by 10 inches by 12 feet.....	120	44.00
460 pieces 3 inches by 10 inches by 16 feet.....	18,000	43.00
14 pieces 3 inches by 10 inches by 12 feet.....	420	43.00
88 pieces 2 inches by 10 inches by 20 feet.....	2,767	43.00
360 pieces 2 inches by 10 inches by 16 feet.....	9,600	43.00
70 pieces 2 inches by 10 inches by 14 feet.....	1,684	43.00
75 pieces 2 inches by 10 inches by 12 feet.....	1,250	43.00
7 pieces 3 inches by 8 inches by 18 feet.....	672	43.00
6 pieces 6 inches by 8 inches by 26 feet.....	624	43.00
5 pieces 6 inches by 8 inches by 22 feet.....	440	43.00
2 pieces 6 inches by 8 inches by 20 feet.....	160	43.00
8 pieces 6 inches by 8 inches by 16 feet.....	512	43.00
12 pieces 6 inches by 8 inches by 12 feet.....	576	43.00
6 pieces 6 inches by 8 inches by 10 feet.....	240	43.00
4 pieces 4 inches by 8 inches by 28 feet.....	299	43.00
2 pieces 4 inches by 8 inches by 20 feet.....	107	43.00
16 pieces 4 inches by 8 inches by 18 feet.....	768	43.00
26 pieces 4 inches by 8 inches by 14 feet.....	971	43.00
10 pieces 4 inches by 8 inches by 12 feet.....	320	43.00
12 pieces 3 inches by 8 inches by 22 feet.....	528	43.00
6 pieces 3 inches by 8 inches by 12 feet.....	144	43.00
6 pieces 2 inches by 8 inches by 18 feet.....	144	43.00
7 pieces 2 inches by 8 inches by 12 feet.....	112	43.00
4 pieces 6 inches by 6 inches by 30 feet.....	360	43.00
27 pieces 4 inches by 6 inches by 16 feet.....	864	43.00
6 pieces 4 inches by 6 inches by 12 feet.....	144	43.00
<b>Derrick timbers, best grade, seasoned, not creosoted:</b>		
1 boom 14 inches by 14 inches by 60 feet.....	960	36.00
1 mast 14 inches by 14 inches by 50 feet.....	817	33.00
4 legs 12 inches by 12 inches by 40 feet.....	1,920	31.00
<b>Creosoted piles, 20 pounds to the cubic foot:</b>		
84, 40 feet long.....		\$15.00
116, 50 feet long.....		18.75
18, 60 feet long.....		22.50

Date of contract: May 22, 1907.

Date of approval: June 11, 1907.

Date of commencement: June 14, 1907.

Date of expiration: July 29, 1907.

## S 3.

## EXAMINATIONS AND SURVEYS AT SOUTH PASS, MISSISSIPPI RIVER.

In accordance with provisions of the river and harbor act approved June 13, 1902, surveys of the shoaler reaches in South Pass and of the jetty channel were made with sufficient frequency, generally weekly and monthly, to determine what changes were taking place and to determine at what locality dredging was most necessary.

Charts Nos. 1, 2, 3, and 4, which accompany this report, show the channel from deeper water in the main river to deeper water in the Gulf of Mexico, a distance of about 14½ miles.

Under circumstances and conditions as they existed, this channel was maintained with the utmost efficiency during the year.

During the last fiscal year detailed annual survey was made from deep water in the Mississippi River through South Pass to deep water in the Gulf of Mexico, and of Pass a Loutre crevasse. The results are shown on the four charts accompanying this report.

Frequent examinations and surveys were made during the past fiscal year of the shoaler reaches in South Pass and beyond the ends of the jetties to determine the condition of the channel. Ranges were established to locate the Eads mattress sill across Southwest Pass, and soundings were taken over the mattress sill to ascertain the part of the sill still in place.

A survey was made covering the mattress sill across Pass a Loutre, and surveys were made and ranges established to locate the proposed mattress sills across The Jump and Cubits Gap.

*Money statement.*

## APPROPRIATION FOR FISCAL YEAR 1906.

July 1, 1906, balance unexpended.....	\$429. 88
June 30, 1907, amount expended during fiscal year.....	429. 88

## APPROPRIATION FOR FISCAL YEAR 1907.

July 1, 1906, amount appropriated by river and harbor act of June 13, 1902, for fiscal year 1907.....	\$10,000. 00
June 30, 1907, amount expended during fiscal year.....	8,500. 00
July 1, 1907, balance unexpended.....	1,500. 00
July 1, 1907, outstanding liabilities.....	1,500. 00
July 1, 1907, total cost of operations during fiscal year.....	10,000. 00

## S 4.

MAINTENANCE AND IMPROVEMENT OF SOUTH PASS CHANNEL,  
MISSISSIPPI RIVER.

For references as to progress of the work see Annual Report of the Chief of Engineers for 1904, page 1886. See also report for 1906, pages 1299-1303.

For convenience of reference the operations for the past fiscal year are given under subheadings.

## MAINTENANCE OF JETTIES AND AUXILIARY WORKS.

*At the head of South Pass and in the pass itself.*—The structures which have been maintained at these localities for many years consist of west dike and upper dam at the head of the pass, three wing dams in the pass itself in Goat Island reach, and seven in Grand Bayou reach. These are more or less of a tentative character, and are maintained from year to year at a comparatively small expense in an efficient condition by the addition of piling, willows, and stone.

*At the mouth of South Pass.*—The works at this locality, which alone require attention and are important factors in the maintenance of the channel through the jetties, consist of the inner east jetty and 38 wing dams. These were maintained as usual during the year.

The materials used during the year in maintaining the works above mentioned were as follows: 486 piles; 55 waling timbers, 60 feet long; 16,043 cords of willows, and 5,733 cubic yards of stone.

The total amount expended during the year in connection with maintenance of jetties and auxiliary works proper was \$149,759.43. This includes outstanding liabilities June 30, 1906, amounting to \$9,598.52.

The following extract from the report of Mr. Cornelius Donovan, assistant engineer, gives in concrete form the operations during the past fiscal year:

*Maintenance of jetties and auxiliary works.*—Dikes and dams at the head of South Pass, wing dams in the pass, jetties and wing dams at the mouth of the pass were maintained in an efficient condition during the year by the addition of 16,043 cords of willows, 5,733 cubic yards of stone, 486 piles, and 55 waling timbers, at a cost of \$49,952.18.

*The plant.*—The plant consisting of buildings, floating property, and wharves received more or less repairs during the year.

*Dredging.*—The dredge *Benyaurd* operated in South Pass channel nine days in July and six days in September, 1906.

The dredge *General Abbot* arrived at South Pass October 18, 1906, and operated in that pass during the remainder of the fiscal year, except from December 26, 1906, to February 10, 1907, during which time it worked in Southwest Pass.

*Navigation of the channel.*—There were few days during the year when the available depth in South Pass was less than 28 feet.

Some mishaps occurred to steamers navigating, but in no instance was it attributable to a lack of depth of water in the channel. Eight grounded beyond the gulf ends of the jetties and were drawing but 17 to 22½ feet; one ran on to the end of the east jetty, and one, drawing 27 feet, grounded on the west side of the channel just below South Pass light-house.

*Money statements.*

## APPROPRIATION FOR FISCAL YEAR 1906.

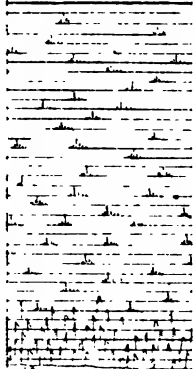
July 1, 1906, balance unexpended.....	\$9,598.52
June 30, 1907, amount expended during fiscal year.....	9,598.52

## APPROPRIATION FOR FISCAL YEAR 1907.

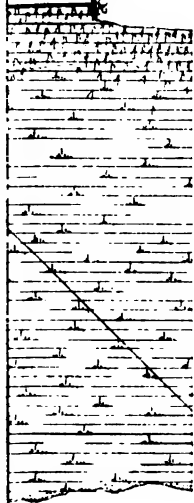
July 1, 1906, amount appropriated by emergency river and harbor act of June 6, 1900.....	\$100,000.00
Miscellaneous receipts during fiscal year deposited to credit of the appropriation.....	24.00
Transferred by Treasury Department from appropriation for Repairs and incidental expenses of light-houses, 1907, on account reimbursement of appropriation for maintenance of South Pass channel, Mississippi River, 1907; on account services rendered by Engineer Corps in driving fender piles at South Pass light-house depot wharf.....	8.14
Amount deposited to credit of this appropriation by Chief Signal Officer, Atlanta, Ga., as reimbursement of expenses incurred by Engineer Corps in testing cable for the Signal Corps.....	6.84
	<hr/>
	100,038.98
June 30, 1907, amount expended during fiscal year.....	90,290.22
	<hr/>
July 1, 1907, balance unexpended.....	9,748.76
July 1, 1907, outstanding liabilities.....	\$7,298.76
July 1, 1907, amount covered by uncompleted contracts.....	2,450.00
	<hr/>
	9,748.76
	<hr/>

## APPROPRIATION FOR MAINTENANCE OF SOUTH PASS CHANNEL, MISSISSIPPI RIVER.

July 1, 1906, balance unexpended.....	\$50,000.00
June 30, 1907, amount appropriated by river and harbor act of March 2, 1907.....	50,000.00
	<hr/>
	100,000.00
June 30, 1907, amount expended during fiscal year.....	49,870.69
	<hr/>
July 1, 1907, balance unexpended.....	50,129.31
July 1, 1907, outstanding liabilities.....	12,285.00
	<hr/>
July 1, 1907, balance available.....	37,844.31
	<hr/>
{ Amount that can be profitably expended in fiscal year ending June 30, 1909, in addition to the balance unexpended July 1, 1907, for maintenance of improvement, in addition to regular annual appropriation of \$100,000.....	50,000.00
{ Submitted in compliance with requirements of sundry civil act of June 4, 1897, and of section 7 of the river and harbor act of 1899.	



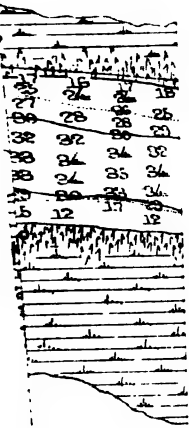
11	13	1
26	24	2
28		2
32	30	3
34		3
	35	3
39		3
	36	3
27	23	2
28	38	2
21	27	2







Light.





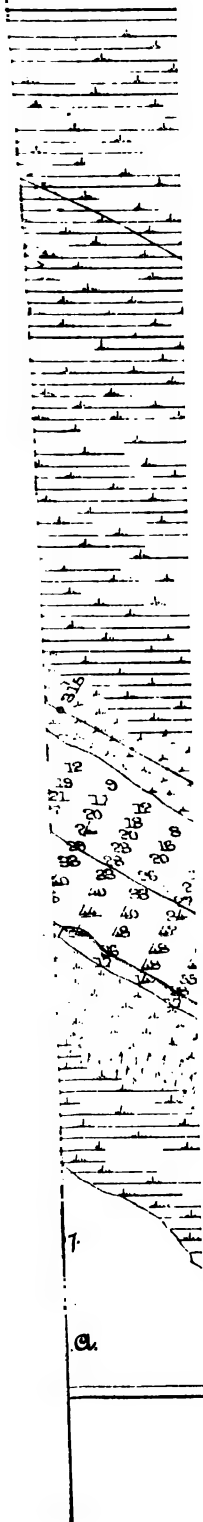




CHART  
OF THE  
**HEAD OF PASSES**

**MISSISSIPPI RIVER.**

showing location of bottom ridges, shoals, etc.

SOUNDINGS PLOTTED

UNDER THE DIRECTION OF

Colonel E.H. Ruffner, Corps of Eng'rs, U.S.A.

by annual report for fiscal year ending June 30, 1907

*E.H. Ruffner.*

Colonel, Corps of Engineers, U.S. Army

THE NORRIS PETERS CO., WASHINGTON, D. C.

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## APPROPRIATIONS.

## MAINTENANCE.

June 6, 1900 (indefinite), \$100,000 annually-----	\$700,000.00
June 6, 1900 (allotted)-----	10,000.00
June 13, 1902-----	75,000.00
June 30, 1906-----	50,000.00
March 2, 1907-----	50,000.00
	<hr/> 885,000.00
Transferred from appropriation for improving Passes of the Mississippi River-----	100.25
Transferred from appropriation for improving Southwest Pass Mississippi River-----	23,305.33
Miscellaneous receipts deposited to the credit of the appropriation--	1,717.46
Transferred by Treasury Department from appropriation for repairs and incidental expenses of light-houses, 1907, on account of services rendered by Engineer Corps in driving piles for Light-House Department-----	8.14
Deposited to credit of appropriation by Chief Signal Officer, Atlanta, Ga., on account expenses incurred by Engineer Corps in testing cable-----	6.84
	<hr/> 910,138.02
Reverted to Treasury-----	73,532.48

## CONTRACTS IN FORCE.

## I.

Name and address of contractor: Richard M. Murphy, New Orleans, La.  
 Work: Furnishing and delivering on barges belonging to the United States willows required for works at South Pass, Mississippi River, during fiscal year ending June 30, 1907.

Contract price: \$1.55 per cord.  
 Date of contract: July 10, 1906.  
 Date of approval: July 21, 1906.  
 Date of expiration: June 30, 1907.

## II.

Name and address of contractor: Ellicott Machine Company, Baltimore, Md.  
 Work: Furnishing material and labor and making cast-steel ball and socket joint for U. S. dredge *General Abbot*.

Contract price: \$547 for first joint; \$347 for subsequent joints.  
 Date of contract: December 31, 1906.  
 Emergency contract.  
 Date of expiration: December 31, 1907.

## III.

Name and address of contractor: Ellicott Machine Company, Baltimore, Md.  
 Work: Furnishing and delivering suction head for U. S. dredge *General Abbot* for a period of one year from date of contract.

Contract price: \$574 for first suction head; \$436 for subsequent ones.  
 Date of contract: January 21, 1907.  
 Emergency contract.  
 Date of expiration: January 20, 1908.

## IV.

Name and address of contractor: Ellicott Machine Company, Baltimore, Md.  
 Work: Furnishing and delivering 6 lengths of wrought-iron pipe for U. S. dredge *General Abbot*.

Contract price: \$1,136.

Date of contract: April 19, 1907.

Emergency contract.

Date of commencement: April 19, 1907.

Date of expiration: May 29, 1907.

## V.

Name and address of contractor: Oscar F. Barrett, Cincinnati, Ohio.

Work: Furnishing and delivering on bank of river at South Pass, Mississippi River, 6,000 cubic yards of stone, to be used in repairing jetties and auxiliary works.

Contract price: \$4.15 per cubic yard.

Date of contract: April 20, 1907.

Date of approval: April 26, 1907.

Date of commencement: April 29, 1907.

Date of expiration: July 28, 1907.

## VI.

Name and address of contractor: Houlton Lumber Company, New Orleans, La.

Work: Furnishing and delivering piles and waling timbers at Port Eads, La., South Pass, Mississippi River.

*Contract price.*

## Yellow pine piles:

300, 30 feet long, at..... \$2.875

100, 40 feet long, at..... 3.75

100, 50 feet long, at..... 4.625

50, 60 feet long, at..... 5.50

Yellow pine waling timbers, 50, 60 feet long, at..... 9.50

Date of contract: June 3, 1907.

Emergency contract.

Date of expiration: August 6, 1907.

## COMMERCIAL STATISTICS FROM JANUARY 1, 1906, TO DECEMBER 31, 1906.

## PORT OF NEW ORLEANS, LA.

*Number and tonnage of vessels entered and cleared.*

Class.	Entered.		Cleared.	
	Number.	Tonnage.	Number.	Tonnage.
<i>I. Vessels required to make report to collector of customs. a</i>				
FOREIGN-BOUND VESSELS.				
Steamers.....	1,102	1,960,811	1,116	2,146,208
Sailing vessels.....	41	34,489	24	21,146
COASTWISE VESSELS.				
Steamers.....	826	729,862	820	617,634
Sailing vessels.....	10	11,966	13	12,516
<i>II. Coastwise vessels not required to report to collector of customs. b</i>				
Steamers.....	20	21,760	18	19,627
Tugs.....	50	7,475	47	7,103
Schooners.....	3	2,601	3	2,601
Barges.....	55	34,202	58	33,318
Total.....	1,607	2,808,166	1,624	2,860,153

<sup>a</sup> From information furnished by the collector of the port of New Orleans.

<sup>b</sup> From information furnished by the New Orleans Dock Board.



*Foreign exports and imports.*

## EXPORTS.

Article.	Year ending December 31, 1906.		Article.	Year ending December 31, 1906.	
	Tons.	Value.		Tons.	Value.
Cotton.....	489,396	\$104,689,485	Manufactures of cotton	582	\$610,796
Cotton-seed cake and meal.....	274,887	6,891,174	Glucose.....	2,742	108,984
Corn.....	484,236	8,477,799	Grease.....	1,950	196,085
Lard and lard compound.....	87,677	6,326,006	Machinery, etc.....	25,434	1,271,708
Leaf tobacco.....	24,060	4,741,817	Pipes and fittings.....	2,019	809,358
Wheat.....	167,820	4,856,674	Boots and shoes.....	936	300,812
Flour.....	97,739	3,301,041	Rosin.....	4,150	109,831
Oats.....	59,982	1,856,235	Flaxseed or linseed.....	8,514	219,880
Cotton-seed oil.....	14,963	1,617,780	Mineral oils.....	12,221	420,690
Boards, deals, and planks.....	289,434	4,238,937	Paraffin.....	4,236	421,000
Staves.....	220,111	3,854,862	Canned beef.....	1,556	288,144
Logs.....	197,988	1,683,898	Tallow.....	10,667	992,199
Agricultural implements.....	1,258	60,416	Pork, salted or pickled.....	2,757	448,114
Horses, mules, etc.....	4,906	520,648	Oleo (the oil).....	2,102	380,759
All other animals.....	530	41,868	Rice-bran, meal, etc.....	9,577	186,709
Barley.....	17,598	380,370	Salt.....	18,377	88,280
Bread and biscuits.....	842	49,379	Soap.....	8,994	243,298
Chemicals, drugs, etc.....	6,567	459,688	Molasses and syrup.....	15,159	230,576
Coal.....	6,747	21,659	Zinc, pig and bars.....	941	116,013
			Miscellaneous.....	53,482	8,022,265
			Total.....	2,572,300	167,829,307

## IMPORTS.

Coffee.....	113,858	\$18,097,289	Wood and manufactures of.....	7,152	\$71,517
Cement.....	12,190	67,638	Toys.....	1,020	356,688
Sugar.....	189,163	5,641,269	Fertilizers.....	10,625	101,960
Molasses.....	16,170	57,750	Earthen, glass, and china ware.....	5,172	517,193
Salt.....	6,609	87,248	India rubber.....	193	249,104
Sisal grass.....	31,025	4,603,169	Cotton, manufactures of.....	506	484,129
Sardines, etc.....	732	180,631	Oils.....	22,529	498,583
Vegetables.....	851	154,936	Sulphur ore.....	10,136	23,671
Fruits and nuts.....	300,821	3,729,849	Tea.....	87	50,167
Fibers and manufactures of.....	14,346	4,308,948	Mahogany logs.....	21,793	409,454
Chemicals, drugs, etc.....	28,212	1,974,817	Spices.....	201	44,379
Wines, liquors, etc.....	1,492	599,861	Miscellaneous.....	9,939	1,490,861
Iron and steel.....	14,722	736,126			
Matting.....	1,012	107,221	Total.....	770,186	44,852,252
Tobacco and cigars.....	131	257,949			

Grand total, 3,342,486 tons, valued at \$212,181,550.

*Domestic shipments and receipts.*

Article.	Year ending December 31, 1906.		Article.	Year ending December 31, 1906.	
	Tons.	Value.		Tons.	Value.
<b>SHIPMENTS.</b>			<b>RECEIPTS.</b>		
Cotton.....	27,696	\$5,926,944	Iron and steel.....	7,443	\$372,150
Cotton seed.....	389	7,780	Mineral products.....	2,004	40,080
Mineral products.....	122,250	2,445,000	Sugar.....	1,700	102,000
Lumber.....	57,157	571,570	Salt.....	187	654
Sugar.....	39,154	2,349,840	Lumber.....	217	2,170
Rice.....	55,406	3,047,330	Asphalt.....	236	772
Salt.....	8,840	80,940	Gasoline.....	6,256	293,266
Wine.....	3,080	214,200	Phosphate.....	1,160	6,960
Flour.....	9,950	517,400	Oil.....	65,758	723,338
Oil, crude.....	12,960	142,560	Coal.....	18,846	84,807
Miscellaneous.....	54,465	8,169,750	Miscellaneous.....	198,964	29,844,600
Total.....	391,337	23,423,314	Total.....	802,771	31,470,797

Grand total, 694,108 tons, valued at \$54,894,111.

## S 5.

## IMPROVEMENT OF BAYOU LAFOURCHE, LOUISIANA.

No work was done during the past fiscal year, as a dam has been constructed across the head of the bayou by State levee boards, under authority of act of Congress approved June 13, 1902. No estimate for additional funds for this improvement is submitted as the time for the removal of the dam has been extended to December, 1907, by joint resolution of Congress approved April 13, 1904.

*Money statement.*

July 1, 1906, balance unexpended	\$1,920.33
July 1, 1907, balance unexpended	1,920.33

## APPROPRIATIONS.

June 13, 1878	\$10,000	August 18, 1894	\$40,000
March 3, 1879	10,000	June 3, 1896	25,000
June 14, 1880	5,000	March 3, 1899 (maintenance)	7,500
July 5, 1884	5,000	June 13, 1902 (maintenance)	7,500
August 11, 1888	50,000		
September 19, 1890	50,000	Total	260,000
July 13, 1892	50,000		

## COMMERCIAL STATISTICS.

[From January 1, 1906, to December 31, 1906, inclusive.]

*Shipments and receipts by water.*

Article.	Year ending December 31, 1906.	
	Tons.	Value.
<b>SHIPMENTS.</b>		
Sugar and molasses	9,106	\$546,360
Vegetables	3,473	104,190
Merchandise	669	66,900
Total shipments	13,248	717,450
<b>RECEIPTS.</b>		
Fertilizers	52	1,040
Gravel	188	180
Machinery	12	1,200
Cotton-seed meal	334	7,014
Vegetables	123	3,690
Brick	478	1,513
Oats	52	858
Coal	219	900
Fuel oil	38,792	239,811
Merchandise	3,649	364,900
Total receipts	38,844	621,106
Grand total	52,092	1,338,556

No reliable data could be secured regarding number of boats that have plied in this stream during the year. Most of the freight is transported on flat-boats towed by mules.

\* The balance unexpended July 1, 1906, \$1,934.26, as shown by report for fiscal year ending June 30, 1906, is in error. The correct balance unexpended was \$1,920.33. The discrepancy arose on account of error in statement of amount expended during fiscal year 1906, which should have been \$88.93 instead of \$75, as stated in the report.

## S 6.

## IMPROVEMENT OF BAYOU PLAQUEMINE, GRAND RIVER, AND PIGEON BAYOUS, LOUISIANA.

For a detailed record of the improvements see references cited on page 1895 of the Annual Report of the Chief of Engineers for 1904. See also report for 1906, pages 1304–1309.

## LOCK AND APPROACHES.

*Plaquemine lock.*—For the purpose of keeping the lock pit free of water during the progress of work under the various contracts, a pumping plant has been installed, consisting of one 30-horsepower and one 20-horsepower boiler, one centrifugal pump with 8-inch suction and 6-inch discharge, one steam cylinder pump with 8-inch suction and 6-inch discharge, and one steam cylinder pump with 4-inch suction and 3-inch discharge. This plant has been operated as required during the year, the work being done by hired labor. A force of laborers has also been employed as required during the past year for the purpose of cleaning the lock chamber of the sediment washed in during the heavy rains which have prevailed.

*Construction and erection of the lock gates.*—A contract was entered into February 8, 1904, for construction of the lock gates, the work being completed May 5, 1906. A description of the gates is given on page 1451 of the Report of the Chief of Engineers for 1905. The sum of \$77,133.25 was expended in connection with this part of the project.

*Power house and operating machinery.*—A contract was entered into with the Otis Elevator Company November 18, 1899, for furnishing and erecting operating machinery and power house necessary for the complete working of the lock. It provided for the operation of the gates by direct-connected hydraulic engines, the whole swing of the gates to be made with one stroke of the piston; the pressure to be piped to the 8 hydraulic engines from a central accumulator supplied and operated by high-pressure steam pumps. The small engines for operating the cylindrical valves for filling and emptying the lock are provided for in the same manner. The work under the contract, including the erection of the power house over the central plant, was completed August 31, 1906. The amount earned by the contractor under this contract was \$114,000. The amount expended under this contract during the fiscal year was \$64,533.70.

It has been demonstrated during the past fiscal year that this plant has perfect control of the gates and operates all filling and emptying valves with ease.

*Protection levee and fill.*—A contract was entered into February 13, 1905, with McGee & Co., of Kansas City, Mo., for constructing a levee connecting the Mississippi River levee system with the southeast corner of the lock, and making a fill behind the southeast and northeast corners of the lock for a distance of 100 feet from the wing walls at the river end. A total of approximately 40,000 cubic yards of material was included under this contract at 59 cents per cubic yard. The work was commenced in March, 1905, and was completed January 28, 1907. The total quantity of material placed was 39,940

cubic yards, costing \$23,564.60. The amount expended under the contract during past fiscal year was \$5,518.70.

*Excavation and construction of the bayou approach and portion of the river approach.*—The contract with Messrs. W. O. Burton & Co., of New Orleans, La., dated June 6, 1905, provides for the excavation and construction of the approach to the lock at the bayou end and for a portion of the approach at the river end, the following work being required: Forty thousand cubic yards of excavation, 10,000 cubic yards of concrete, 1,650 piles 50 feet long, 2,100 piles 35 feet long, and 11 snubbing posts. The commencement of this work was delayed by the yellow-fever epidemic until October 10, 1905. To June 30, 1907, 3,950 cubic yards of material had been excavated from the bayou approach and placed behind the lock walls, and 16,250 cubic yards had been placed at the river end. In addition, 712 piles 35 feet long and 639 piles 50 feet long were driven, and 7,910 cubic yards concrete had been placed.

The excavation work has been particularly difficult, a large part of the area being a drift deposit formed when the bayou was open to the river, and a great number of large cypress stumps were found at the bottom of the excavation. The sliding of the adjacent banks has delayed the work and added about 8,000 cubic yards of earth to the original quantity of excavation required. The sum of \$68,037.01 was expended in connection with work under this contract during the year, making a total expended to June 30, 1907, of \$86,331.59.

*Completion of river approach.*—Proposals were opened July 11, 1906, for the construction of the river approach from the terminating lines of the work already under contract to a cofferdam at the bank of the Mississippi River. A contract was entered into August 7, 1906, with the lowest bidders, W. O. Burton & Co., and the work was commenced in September, 1906. This work includes moving about 10,000 cubic yards of earth from the present river levee 125 feet toward the river and constructing there a cofferdam, 8,000 cubic yards of excavation, 5,500 cubic yards of concrete, 2,600 piles 50 feet long, and placing two clusters of guide piles. The completion of this contract will leave between the approach and the river a volume of earth containing about 45,000 cubic yards, which can be removed by dredging in a short time when the other work is completed. A total of 29,650 cubic yards of earth had been excavated and 637 fifty-foot piles delivered under this contract to June 30, 1907. The total expended under this contract to June 30, 1907, was \$19,727.71.

During the past fiscal year the operation of the pumping plant has been continued, a total of \$3,540.13 having been expended on this work.

A total of \$1,811.40 was expended during the past fiscal year for office and incidental expenses connected with this work.

#### BAYOU PLAQUEMINE, GRAND RIVER AND PIGEON BAYOUS.

No work was done during the year under the contracts with Charles Clarke & Co., of Galveston, Tex., for dredging in Bayou Plaquemine. Under the terms of the supplemental contract approved April 11, 1905, work is suspended until the lock is open to navigation, when dredging will be resumed and the material deposited in deep water of the Mississippi River. The partial channel dredged during the

past fiscal year has been largely used during the past year and has been of great help in delivering materials for the work on the bayou approach.

The act of July 13, 1892, included in the general project for improving Bayou Plaquemine, the improvement of Grand River and Pigeon bayous, to extend the navigable waterway to Bayou Teche. Since that date these streams have been cleared of obstructions by snagging and dredging, and a channel 50 feet wide and 10 feet deep was dredged through Flat Lake and Bay Natchez under contract. This channel was dredged with perpendicular sides, allowing the bank to take its own slope, and shoaling has taken place in portions of the channel. Recent developments also indicate that Grand River above Bay Natchez for a distance of 3 or 4 miles has shoaled. The present width of channel is inadequate for the proper accommodation of the commerce which will utilize this route with the opening of the lock at Plaquemine. The dredging in Bayou Plaquemine will be completed to afford a channel 10 feet deep and 125 feet wide, and it is believed that this width of channel should be provided for the route through Grand River. At the time of dredging the 50-foot channel, however, the funds available for this portion of the project would not permit of the expenditure necessary to procure the wider channel. It is believed that sufficient information is at hand to enable the approximate cost of the work to be stated without a special survey.

*Bank protection.*—The Plaquemine lock is situated on a caving bank of the Mississippi River, and the bank has been revetted with mattress work immediately above and below the lock. The last work done to protect the bank was during the season of 1901-2, about one-half mile above the site of the lock. During the low water of 1903 a cave developed just above this work, 1,000 feet in extent. During the season of 1905 there were two caves about three-quarters of a mile above the mattress work. This cave is no doubt increased, if not induced, by the formation on the opposite side of the river of an extensive sand bar. The ultimate result of the formation of this bar and the resultant encroachment of the river will be a flanking movement with respect to the lock if proper precautions are not taken. The revetment work should be extended as rapidly as possible with willow mattresses weighted with rock, so as to cover as early as possible the area threatened above the work now in place.

The work during the year has been in the local charge of Mr. J. I. Conklin, United States assistant engineer, stationed at Plaquemine.

The following is an extract from his report for the fiscal year:

*Otis Elevator Company.*—Constructing power house and operating machinery.

*Charles Clarke & Co.*—Widening and deepening Bayou Plaquemine between the railroad bridge at Plaquemine, La., and Dardennes Bend, a distance of 5.08 miles.

*McGee & Co.*—Constructing protection levee and making back fill.

*W. O. Burton & Co.*—Constructing approaches, Plaquemine, La., under date of June 6, 1905.

*W. O. Burton & Co.*—Constructing river approach, Plaquemine, La., under date of August 7, 1906.

*Plaquemine lock.*—With all contracts in force the United States assumes the duty of keeping the lock chamber and approaches free from water. There is maintained in this work a pumping plant, consisting of one 30-horsepower boiler and one 20-horsepower boiler, one centrifugal pump with 8-inch suction and 6-inch discharge, one steam cylinder pump with 8-inch suction and 6-inch discharge, and one steam cylinder pump with 4-inch suction and 3-inch discharge.

Upon completion of the bayou approach the pumps were so arranged that during freshets the entire plant can be utilized for quick drainage.

The entire plant is in good condition and will be available for use for other purposes on completion of the work.

During a portion of the time it has been necessary to clear the lock chamber from sediment washed in during heavy rains to allow free movements of the gates.

**Maintenance.**—The operating machinery and power house was, upon completion, turned over to the United States, and it has been operated at least once every week to keep all parts of the plant in good condition. There has been employed for this work and for other maintenance work two steam engineers and a force of labor as the needs required.

**Settlement of lock walls and mitering of gates.**—As the fill is placed behind the lock wall, the settlement of the walls continues, and the walls so far have had a decided tendency to spread at the top away from the perpendicular. This matter is of serious consideration, as it affects the mitering of the gates and the clearance of the hydraulic cylinders operating the gates and all adjustment relative thereto.

The levels have been taken upon five points on each sill, and the settlement as measured at these points may be noticed by the following summary:

SILL 1.

Interval.	North.	Center.				South.
	A.	B.	C.	D.	E.	
Up to August 20, 1900 .....	0.135	0.106	0.106	0.122	0.136	
August 20, 1900, to July 5, 1901 .....	.287	.176	.146	.185	.262	
July 5, 1901, to June 15, 1902 .....	.047	.019	.082	— .006	.061	
June 15, 1902, to June 8, 1904 .....	.020	.010	— .013	.036	.012	
June 8, 1904, to December 27, 1905 .....	.253	.133	.136	.146	.155	
December 27, 1905, to June 20, 1906 .....	.024	— .016	— .017	— .006	.015	
June 20, 1906, to June 17, 1907 .....	.123	.005	.031	.060	.083	
Total settlement in feet .....	.889	.433	.421	.537	.724	

SILL 2.

Interval.	North.	B.	C.	D.	South.	
Up to August 20, 1900 .....	0.121	0.151	0.146	0.161	0.164	
August 20, 1900, to July 15, 1901 .....	.335	.202	.172	.203	.264	
July 15, 1901, to June 15, 1902 .....	.023	.023	.011	.006	.066	
June 15, 1902, to June 8, 1904 .....	.042	.004	.006	.030	— .006	
June 8, 1904, to December 27, 1905 .....	.217	.148	.153	.152	.228	
December 27, 1905, to June 20, 1906 .....	.022	— .008	— .008	.018	.018	
June 20, 1906, to June 17, 1907 .....	.129	.037	.038	.058	.091	
Total settlement in feet .....	.889	.557	.518	.628	.810	

SILL 3.

Interval.	North.	B.	C.	D.	South.	
Up to August 20, 1900 .....	0.096	0.171	0.139	0.145	0.171	
August 20, 1900, to July 5, 1901 .....	.344	.173	.102	.168	.232	
July 5, 1901, to June 15, 1902 .....	.030	.014	— .002	.013	.035	
June 15, 1902, to June 8, 1904 .....	.016	.000	— .013	.001	.018	
June 8, 1904, to December 27, 1905 .....	.050	.050	.022	.059	.101	
December 27, 1905, to June 20, 1906 .....	.037	.014	.001	.055	.007	
June 20, 1906, to June 17, 1907 .....	.107	.038	.017	— .034	.034	
Total settlement in feet .....	.680	.460	.266	.407	.596	

SILL 4.

Interval.	North.	B.	C.	D.	South.	
Up to August 20, 1900 .....	0.192	0.152	0.139	0.155	0.165	
August 20, 1900, to July 5, 1901 .....	.238	.160	.104	.168	.238	
July 5, 1901, to June 15, 1902 .....	.027	.010	.008	.030	.036	
June 15, 1902, to June 8, 1904 .....	.019	.007	.002	.007	.017	
June 8, 1904, to December 27, 1905 .....	.061	.031	.001	.065	.076	
December 27, 1905, to June 20, 1906 .....	.030	.011	.009	— .018	.000	
June 20, 1906, to June 17, 1907 .....	.095	.028	.013	.032	.039	
Total settlement in feet .....	.662	.399	.271	.469	.570	

## BILL 5.

Interval.	North.	Center.				South.
	A.	B.	C.	D.	E.	
Up to August 20, 1900 .....	0.189	0.152	0.142	0.153	0.179	
August 20, 1900, to July 5, 1901 .....	.229	.138	.101	.172	.238	
July 5, 1901, to June 15, 1902 .....	.029	.009	— .198	.021	.027	
June 15, 1902, to June 8, 1904 .....	.017	— .018	.195	.005	.027	
June 8, 1904, to December 27, 1905 .....	.042	.102	.024	.082	.055	
December 27, 1905, to June 20, 1906 .....	.024	.016	— .013	— .003	— .001	
June 20, 1906, to June 17, 1907 .....	.084	.039	.016	.026	.037	
Total settlement in feet .....	.614	.443	.267	.456	.557	

*Distances between miter posts, gates closed. Showing movement (in inches) since last adjustment of yoke, November 16, 1906, to June 17, 1907.*

Observation taken.	Gate 1.		Gate 2.		Gate 3.		Gate 4.		Temperature.
	Top.	Bottom.	Top.	Bottom.	Top.	Bottom.	Top.	Bottom.	
November 16, 1906.	<i>Inches.</i> 1- $\frac{1}{8}$	<i>Inches.</i> 1- $\frac{1}{8}$	<i>Inches.</i> 2- $\frac{1}{8}$	<i>Inches.</i> 1- $\frac{1}{8}$	<i>Inches.</i> 3- $\frac{1}{8}$	<i>Inches.</i> 1- $\frac{1}{8}$	<i>Inches.</i> 3- $\frac{1}{8}$	<i>Inches.</i> 1- $\frac{1}{8}$	<i>Degrees.</i> 84
June 17, 1907 .....	6- $\frac{1}{8}$	1- $\frac{1}{8}$	7- $\frac{1}{8}$	1- $\frac{1}{8}$	5- $\frac{1}{8}$	1- $\frac{1}{8}$	6- $\frac{1}{8}$	1- $\frac{1}{8}$	98

It will be noted that the constant variations of levels and increase of distances between miter posts has gone beyond the adjustment left in the anchorage yokes, and will necessitate placing a plate, in some cases, on each half of a gate.

The miter post and quoin post plates have been left free for final adjustment. The complete record of observations taken is shown on blueprint inclosed.

*Otis Elevator Company.*—This contract was practically completed at the end of the last fiscal year. The steam accumulator first placed proved defective and was replaced. The power house was completed and the final adjustment of all operating machinery and tests of hydraulic capstans was completed and the work accepted in August, 1906.

*McGee & Co.*—A contract was awarded this company on February 13, 1905, to construct a levee connecting the Mississippi River levee system with the southeast corner of the lock and making a fill behind the southeast and northeast corners of the lock for a distance of 100 feet from the wing walls at the river end of the lock—the contract carrying in all approximately 40,000 cubic yards of earth.

The following is a statement of the work done during the fiscal year:

Month of—	Levee and fill, south side.
October, 1906 .....	<i>Cubic yds.</i> 1,000
November, 1906 .....	1,000
December, 1906 .....	500
January, 1907 .....	3,540
Total .....	6,040

This work was completed and accepted in January, 1907.

*Chas. Clarke & Co.*—No work was done during the year on the original or supplemental contracts, as under the terms of the supplemental contract the work is not to be resumed until the lock is in operation and the material can be taken through the lock and deposited in deep water in the Mississippi River.

Work is to be resumed within thirty days after notification that the lock is ready for operation.

*W. O. Burton & Co. contract of June 6, 1905.*—A contract was entered into with this company on June 6, 1905, for completing the approach on the bayou end of the lock, and a portion of the approach at the river end of the lock. A portion of the river approach was included in this contract for the purpose of expediting the final work on the river approach, and it was also for the purpose

of completing the portion where there was most danger of caves before the levee system is breached.

There was included in this contract approximately 40,000 cubic yards of excavation, 10,000 cubic yards of concrete, 1,050 50-foot piling, and 2,100 35-foot piling and 11 snubbing posts.

The quantity of excavation has exceeded the estimated quantity by a considerable amount on account of caving or slipping banks during the progress of the work. There were many serious difficulties met in the execution of this work, as nearly the whole excavation was in large stumps and drift that had been deposited when the bayou was open to the Mississippi River.

The work on the river approach of this contract is to be done with the same plant that is to do the final work.

The following is a summary of the work done during the year:

Date.	Excavation.		Piling.			Concrete.		Snubbing posts.
	Bayou end.	River end.	Bayou end.		River end—50-foot.	Bayou end.	River end.	
			35-foot.	50-foot.				
1906.	Cubic yards.	Cubic yards.	Number.	Number.	Number.	Cubic yards.	Cubic yards.	Number.
July ..	600		80	78				
August ..	500		181	140		310		
September ..	700		113	37		1,690		
October ..	250		243	167		2,130		
November ..	1,200		70	133		1,350		2
December ..	700		25			1,400		9
1907.								
January ..		3,100				1,030		
February ..		8,450						
March ..		2,700			84			
April ..		2,000						
Total .....	3,950	16,250	712	555	84	7,910		11

*W. O. Burton & Co. contract of August 7, 1906.*—A contract was entered into with this company on August 7, 1906, for completing the river approach, and carried the following items:

Excavation .....	cubic yards..	80,000
Furnishing sand and gravel .....	do .....	5,500
Furnishing cement mixed and placing concrete .....	do .....	5,500
Furnishing 50-foot piling .....	piles .....	2,600
Driving 50-foot piling .....	do .....	2,600
Furnishing and placing guide-pile clusters, of three each .....	clusters .....	2
Moving levee .....	cubic yards..	10,000

The contractors, in planning to do this work, placed a contract with an eastern firm to furnish a cable way for removing earth and placing material, and had contracted for the delivery of the plant on October 1, 1906. The firm did not deliver the plant as contracted for, and notified W. O. Burton & Co. that they did not know when delivery could be made, and the contractor was forced to find another plant in order to commence the work at once. There was then purchased a large excavating machine with a 3-yard bucket capable, under favorable conditions, of excavating 1,000 cubic yards of earth in ten hours.

The contractors then drove piling for a railroad track to carry the material from the river approach to back of the wall, making the back fill by means of two trains operated by small locomotives. It was with great difficulty that the railroad was maintained on the piling as the earth was deposited. The piling moved, laterally, away from the back of the lock wall as much as 20 feet, making the track full of short curves, elevations, and depressions. This method was used until April, 1907, when there developed a slip that destroyed the loading track on the side of the excavation, necessitating the adoption of some other method of carrying the earth from the approach to behind the lock



walls. The contractors were then forced to install a cable way which, at this writing, is just beginning to work.

The following is a summary of the work done during the year:

Date.	Excavation.	
	For levee.	For approach.
	<i>Cubic yards.</i>	<i>Cubic yards.</i>
1906.		
September .....	6,000	
October .....	5,500	
November .....	3,100	
1907.		
February .....		750
March .....		11,800
April .....		2,500
Total .....	14,600	15,050

The cross section of the protection levee was increased, and thereby increased the amount of earth to 14,600 cubic yards.

The contractors are behind with this contract, and it will require efficient and rapid work to complete it within the contract time, December 31, 1907.

*Bank protection.*—As pointed out in the last annual report, the Plaquemine lock is on a caving bank of the river, which has been revetted with mattress work above and below the lock, the last work being done during the season of 1901-2 about one-half mile above the site of the lock. A cave developed in 1903 just above this work, the cave being about 1,000 feet in extent, and in 1906 there were two caves about three-fourths of a mile above the mattress work.

The necessity of extending the mattress work as rapidly as possible, so as to cover the threatened area, is emphasized, and the policy of extending as much as possible, year by year, is recommended.

*Bay Natchez and Flat Lake.*—Attention is invited to the last annual report, to the dredging of a channel 50 feet wide and 10 feet deep with perpendicular banks, and the dangers and difficulties of using this narrow channel with serious obstructions close to the edge on both sides. Recent inspection of these channels has shown that the channel as dredged has maintained its depth and, in some cases, has deepened. The reach of Grand River between bayous Pigeon and Posteo is, however, shoaling. It is now, with the early completion of the lock in view, especially desirable that the width of these channels be increased to 125 feet and extended to cover the shoaling reach. In fact, the advantages that the lock will bring can not be utilized without this widening and extension. An approximate estimate of the quantities of earth required to obtain this width can be made from former surveys. An accurate survey showing present conditions could be made for \$2,500.

*Money statement.*

July 1, 1906, balance unexpended-----	\$422, 763. 20
Amount appropriated by river and harbor act approved March 2, 1907-----	\$100, 000. 00
Amount allotted from appropriations for emergencies, acts of March 3, 1905, and March 2, 1907-----	20, 000. 00
	<u>120, 000. 00</u>
	542, 763. 20
June 30, 1907, amount unexpended during fiscal year : For works of improvement-----	\$162, 768. 65
For maintenance of improvement-----	8, 046. 36
	<u>170, 815. 01</u>
July 1, 1907, balance unexpended-----	371, 948. 19
July 1, 1907, outstanding liabilities-----	19, 909. 70
	<u>352, 038. 49</u>
July 1, 1907, balance available-----	<u>217, 044. 14</u>
Amount that can be profitably expended in fiscal year ending June 30, 1908, in addition to the balance unexpended July 1, 1907 : For works of improvement-----	
For maintenance of improvement-----	\$325, 000. 00
	20, 000. 00
	<u>345, 000. 00</u>
Submitted in compliance with requirements of sundry civil act of June 4, 1897, and of section 7 of the river and harbor act of 1890.	

## APPROPRIATIONS.

August 11, 1888-----	\$100, 000	March 3, 1901-----	\$210, 000
September 19, 1890-----	100, 000	March 3, 1905-----	35, 000
July 13, 1892-----	150, 000	March 3, 1905 (allotment) _	10, 000
August 18, 1894-----	110, 000	June 30, 1906-----	100, 000
June 3, 1896-----	20, 000	March 2, 1907-----	100, 000
June 4, 1897-----	350, 000	March 2, 1907 (allotment) _	10, 000
March 3, 1899-----	400, 000		
June 6, 1900-----	200, 000		<u>1, 895, 000</u>

## CONTRACTS IN FORCE.

## I.

Name and address of contractor : Otis Elevator Company, New York, N. Y.

Work : Constructing operating machinery and power house for lock.

Contract price : \$114,000, to be paid on completion and acceptance of work, modified by supplemental contract dated August 28, approved by the Secretary of War September 13, 1905, to permit partial payment of \$50,000 ; payment made September 25, 1905.

Date of contract : November 18, 1899.

Date of approval : December 30, 1899.

Date of commencement : Notified to commence work on July 23, 1904.

Date of expiration : January 23, 1905 ; time limit waived.

Contract completed August 31, 1906.

## II.

Name and address of contractor : Charles Clarke & Co., Galveston, Tex.

Work : Dredging to enlarge bed of Bayou Plaquemine from the railroad bridge to deep water below Dardennes Bend. Estimated amount of material to be removed, 1,027,509 cubic yards.

Contract price : 13.98 cents per cubic yard.

Date of contract : July 15, 1899.

Date of approval : September 13, 1899.

Date of commencement: November 12, 1899.

Date of expiration: June 30, 1901; extended to June 30, 1902; time limit waived.

## III.

Name and address of contractor: Charles Clarke & Co., Galveston, Tex.

Work: Provides for modification of method of work on contract of July 15, 1899, for enlarging bed of Bayou Plaquemine and for certain additional work, no change in contract price being involved. Estimated number of additional cubic yards of material provided for by this supplemental contract, 80,000.

Date of contract: March 30, 1905.

Date of approval: By the Chief of Engineers, April 11, 1905; by the Secretary of War, April 11, 1905.

Supplemental contract.

## IV.

Name and address of contractor: McGee & Co., Kansas City, Mo.

Work: Constructing levee and making fill behind walls of the lock; estimated amount of earth to be placed, 40,000 cubic yards.

Contract price: 59 cents per cubic yard of earth placed.

Date of contract: February 13, 1905.

Date of approval: February 17, 1905.

Date of commencement: April 18, 1905.

Date of expiration: August 18, 1905; time limit waived.

Contract completed January 28, 1907.

## V.

Name and address of contractor: W. O. Burton & Co., New Orleans, La.

Work: Excavation and construction of approaches to the lock.

Date of contract: June 6, 1905.

Date of approval: June 19, 1905.

Date of commencement: August 19, 1905.

Date of expiration: January 19, 1906; time limit waived.

Items.	Estimated quantities.	Prices.	Amounts.
50-foot piles.....number..	1,650	\$12.50	\$20,625
35-foot piles.....do.....	2,100	8.75	18,375
Excavation.....cubic yards..	40,000	.40	16,000
Concrete.....do.....	10,000	5.50	55,000
Snubbing posts.....number..	11	20.00	220
Total .....			110,220

## VI.

Name and address of contractor: W. O. Burton & Co., New Orleans, La.

Work: Excavation and construction of river approach and back fill of lock at Plaquemine, La.

Contract price: Moving levee, 30 cents per cubic yard; sand and gravel or broken stone for concrete, \$2 per cubic yard; furnishing cement for concrete, mixing and placing concrete, \$3 per cubic yard; piles, \$3 each; driving piles, \$1.50 per pile; excavating for approach and placing earth, \$1.05 per cubic yard; furnishing and setting in place guide piles, \$.75 per cluster.

Date of contract: August 7, 1906.

Date of approval: August 29, 1906.

Date of commencement: September 25, 1906.

Date of expiration: Four months from the time after May 1, 1907, that the Mississippi River gauge reads 20 feet at Plaquemine, La.

## VII.

Name and address of contractor: Chas. Clarke & Co., Galveston, Tex.

Work: Dredging 45,000 cubic yards of earth at river approach, Plaquemine lock.

Contract price: 13.98 cents per cubic yard.

Date of contract: August 25, 1906.

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Date of approval: August 30, 1906.

Date of commencement: Not yet commenced. The work under this contract is to be done at the same time and in connection with the completion of contract dated July 15, 1899, for dredging and enlarging bed of Bayou Plaquemine.

Supplemental contract.

## COMMERCIAL STATISTICS.

[From January 1, 1906, to December 31, 1906.]

### *Vessels entering and departing.*

Number .....	184
Net registered tonnage.....	4, 450
Draft of heaviest vessel:	
Light .....	6 feet
Loaded .....	9½ do

### *Shipments and receipts by water.*

Article.	Tons.	Value.
Shipments:		
Lumber, as logs.....	151, 000	\$2, 718, 000
Merchandise.....	75, 100	1, 900, 000
Sugar cane.....	20, 900	83, 600
Total.....	247, 000	4, 701, 600
Receipts:		
Coal and fuel oil.....	325, 000	1, 462, 500
Grand total.....	572, 000	6, 164, 100

## S 7.

### IMPROVEMENT OF BAYOU TECHE, LOUISIANA.

For references as to the progress of the work see page 1901 of the Annual Report of the Chief of Engineers for 1904.

Bayou Teche is an important commercial stream of southern Louisiana, and is the waterway for shipping for the numerous sugar and lumber mills located along its banks. With the exception of snags, the channel is in a fairly good condition below New Iberia, but of late years it has shoaled considerably between New Iberia and St. Martinville, and is not navigable above the latter point. The improvement of channel accomplished will not be a permanent one, as sunken logs, fallen trees, and shoals are constantly forming obstructions which will require removal.

Proposals for dredging were opened September 9, 1905, but the only bid received was rejected as excessive, and, on account of the prevalence of yellow fever in Louisiana that year, readvertisement for dredging proposals was deferred.

No work was done during the past fiscal year beyond the location of the site of the lock near St. Martinville and the site of the dam across the head of Bayou Vermilion. The land required at site of lock was surveyed by the Citizens' League of St. Martinville, La. At the close of the fiscal year the league was trying to arrange for the transfer to the United States of the land required for lock and dam purposes and canal feeders.

*Money statement.*

July 1, 1906, balance unexpended.....	\$3,206.47
July 1, 1907, amount appropriated by river and harbor act of March 2, 1907, for lock and dam and maintenance.....	130,000.00
	<hr/> 133,206.47
June 30, 1907, amount expended during fiscal year, for maintenance.....	79.39
	<hr/> 133,127.08
July 1, 1907, balance.....	<hr/> <hr/> 133,127.08
<div style="display: flex; align-items: center;"> <div style="font-size: 3em; margin-right: 10px;">{</div> <div>           Amount that can be profitably expended in fiscal year ending June 30, 1909, for maintenance of improvement, in addition to balance unexpended July 1, 1907.....            Submitted in compliance with requirements of sundry civil act of June 4, 1897, and of section 7 of the river and harbor act of 1899.         </div> </div>	
	10,000.00

## APPROPRIATIONS.

July 11, 1870.....	\$17,500	March 3, 1899.....	\$10,000
June 14, 1880.....	6,000	June 13, 1902 (maintenance).....	7,500
March 3, 1881.....	20,000	March 3, 1905 (maintenance).....	7,500
July 5, 1884.....	6,500	March 2, 1907 (lock and dam and maintenance).....	130,000
September 19, 1880.....	5,000		
August 18, 1894.....	6,000		
June 3, 1896.....	10,000	Total.....	<hr/> 226,000

## COMMERCIAL STATISTICS.

[From January 1, 1906, to December 31, 1906, inclusive.]

*Receipts and shipments.*

Articles.	Year ending December 31, 1906.	
	Tons.	Value.
<b>Shipments:</b>		
Sugar.....	50,621	\$3,609,840
Molasses.....	8,048	288,400
Cotton.....	448	106,280
Rice.....	91	35,070
Cotton-seed products.....	552	11,562
Brick.....	55,888	177,225
Fuel oil.....	17,996	128,671
Lumber.....	8,752	262,560
Machinery.....	8,460	846,000
Coal.....	2,000	8,400
Cane.....	180,000	442,000
Miscellaneous.....	84,620	2,596,500
Total shipments.....	<hr/> 816,961	<hr/> 8,512,518
<b>Receipts:</b>		
Machinery.....	1,110	111,000
Fertilizers.....	8,065	61,300
Cooperage.....	1,536	25,228
Coal.....	2,725	11,445
Fuel oil.....	114,716	820,219
Cane.....	35,000	119,000
Logs.....	219,451	2,194,510
Miscellaneous.....	11,628	864,600
Total receipts.....	<hr/> 389,130	<hr/> 4,207,802
Grand total.....	<hr/> 706,091	<hr/> 12,719,820

## S 8.

## REMOVING SUNKEN VESSELS OR CRAFT OBSTRUCTING OR ENDANGERING NAVIGATION—INDEFINITE.

An allotment of \$35 was made from this appropriation, act of March 3, 1899, on December 28, 1906, to be applied toward payment of expenses incurred in advertising for proposals for removing sunken logs from Bayou Teche, Louisiana. The expenses were paid during the fiscal year.

The only proposal received was considered excessive and was rejected. Many complaints were received during the fiscal year regarding sunken logs in this stream, but do not seem to have been made from the standpoint of the improvement of navigation or removal of wrecks obstructing navigation, but were made for the purpose of obtaining the privilege of removing logs to obtain ownership in them when so removed.

## APPENDIX T.

### IMPROVEMENT OF HOMOCHITTO RIVER, MISSISSIPPI, AND OF CERTAIN RIVERS AND HARBORS IN SOUTHERN LOUISIANA AND EASTERN TEXAS.

REPORT OF CAPT. J. F. McINDOE, OFFICER IN CHARGE, FOR THE FISCAL YEAR ENDING JUNE 30, 1907.

#### IMPROVEMENTS.

- |  |  |
|--|--|
| <ol style="list-style-type: none"><li>1. Homochitto River, Mississippi.</li><li>2. Bogue Chitto, Chefuncte River and Bogue Falla, Tickfaw River and tributaries, and Amite River and Bayou Manchac, Louisiana.</li><li>3. Inland Waterway from Franklin to Mermentau, Louisiana.</li><li>4. Channel, bay, and passes of Bayou Vermillion and Mermentau River and tributaries, Louisiana.</li></ol> | <ol style="list-style-type: none"><li>5. Mouth and passes of Calcasieu River, Louisiana.</li><li>6. Johnsons Bayou, Louisiana.</li><li>7. Mouths of Sabine and Neches rivers, Texas.</li><li>8. Operating and care of Port Arthur Canal, Texas.</li><li>9. Harbor at Sabine Pass, Texas.</li><li>10. Removing water hyacinths from Louisiana waters.</li></ol> |
|--|--|

UNITED STATES ENGINEER OFFICE,  
*New Orleans, La., July 8, 1907.*

GENERAL: I have the honor to submit herewith annual report upon the work of river and harbor improvement in the Gulf Division in my charge for the fiscal year ending June 30, 1907.

\* \* \* \* \*

Very respectfully, your obedient servant,

J. F. McINDOE,  
*Captain, Corps of Engineers.*

Brig. Gen. A. MACKENZIE,  
*Chief of Engineers, U. S. A.*

#### T I.

#### IMPROVEMENT OF HOMOCHITTO RIVER, MISSISSIPPI.

For history of this work, project, and results accomplished, see current summary, page 409; also Annual Report of the Chief of Engineers for 1905, page 1457.

No work was done during the fiscal year ending June 30, 1907, on account of the continued high stage of the river. There was expended during the year \$61.25 for rope and tackle to be used on the

steamboat which it was expected to use for removing obstructions from this river. The plans for the combined dredge and snag boat were commenced.

*Money statement.*

July 1, 1906, balance unexpended.....	\$2,393.44
Amount appropriated by river and harbor act approved March 2, 1907..	4,000.00
	<hr/> 6,393.44
June 30, 1907, amount expended during fiscal year, for maintenance of improvement.....	61.25
	<hr/> 6,332.19
July 1, 1907, balance unexpended.....	

APPROPRIATIONS.

March 3, 1899.....	\$16,000	March 2, 1907.....	\$4,000
June 13, 1902.....	2,000		
March 3, 1905.....	2,000	Total.....	24,000

COMMERCIAL STATISTICS.

[From January 1, 1906, to December 31, 1906.]

*Shipments by water.*

[No boats ply regularly on this river. All timber is rafted.]

No detailed commercial statistics for the calendar year 1906 were available. Circular letters and blank forms were sent out, but no replies were received.

T 2.

IMPROVEMENT OF BOGUE CHITTO, CHEFUNCTE RIVER, BOGUE FALLIA, TICKFAW RIVER AND TRIBUTARIES, AMITE RIVER, AND BAYOU MANCHAC, LOUISIANA.

(A) BOGUE CHITTO.

For history of this work, project, and results accomplished, see current summary, page 410; also Annual Report of the Chief of Engineers for 1905, page 1458.

No work was done during the fiscal year ending June 30, 1907, none being considered necessary.

Reference is invited to recommendation in current summary, page 410, that appropriations for this stream be discontinued.

*Money statement.*

July 1, 1906, balance unexpended.....	\$157.46
June 30, 1907, amount expended during fiscal year, transferred to "Tickfaw River," authority Acting Secretary of War.....	157.46
	<hr/> 30,000.00
Amount (estimated) required for completion of existing project.....	



## APPROPRIATIONS.

September 19, 1890.....	\$5,000	March 3, 1899.....	\$5,000
July 13, 1892.....	5,000	June 13, 1902 (allotted).....	3,000
August 18, 1894.....	5,000		
June 3, 1896.....	5,000	Total.....	28,000

## COMMERCIAL STATISTICS.

[From January 1, 1906, to December 31, 1906.]

No boats ply regularly on this river. All timber is rafted.

## (B) CHEFUNCTE RIVER AND BOGUE FALLS.

For history of this work, projects, and results accomplished, see current summary, page 411, and Annual Report of the Chief of Engineers for 1905, page 1459.

No work was done during the fiscal year, the amount of funds available being too small for effective work until near the end of the year.

The plans for the combined dredge and snag boat to be constructed under the approved project were commenced.

The expenditures made during the year were for collection of commercial statistics.

*Money statement.*

July 1, 1906, balance unexpended.....	\$472.05
Amount appropriated by river and harbor act approved March 2, 1907.....	8,000.00
	8,472.05
June 30, 1907, amount expended during fiscal year, for maintenance of improvement.....	30.80
July 1, 1907, balance unexpended.....	8,441.25

## APPROPRIATIONS.

March 3, 1881.....	\$1,500.00	March 2, 1907 (allotted)...	\$8,000.00
August 2, 1882.....	1,500.00		
August 5, 1886.....	2,500.00	Total.....	22,000.00
September 19, 1890.....	1,000.00	February 24, 1903, amount transferred to allotment for "Improving Amite River and Bayou Manchac, Louisiana".....	1,194.01
July 13, 1892.....	1,000.00		
August 18, 1894.....	1,000.00	Total balance.....	20,805.99
June 3, 1896.....	1,000.00		
March 3, 1899.....	1,000.00		
June 13, 1902.....	3,000.00		
March 3, 1905 (allotted)---	500.00		

## COMMERCIAL STATISTICS.

[From January 1, 1906, to December 31, 1906.]

*Vessels entering and departing.*

Class.	Number.	Trips.	Net registered tonnage.
Steamers.....	12	1,788	345
Sailing vessels.....	33	1,099	643
Barges.....	31	1,246	2,599
Total .....	76	4,133	3,587

*Shipments and receipts by water.*

Articles.	Tons.	Value.
Lumber.....	31,638	\$303,721
Logs .....	1,050	4,725
Sand, brick, and clay.....	189,692	155,522
Rosin, turpentine, and tar .....	1,354	8,401
Fuel, wood .....	1,265	5,080
Hides, skins, furs, and wool .....	2	251
Live stock .....	462	133,056
Miscellaneous freight.....	9,938	496,650
Cotton .....	222	4,450
Molasses and rice.....	109	2,834
Total .....	235,727	1,114,670

## (C) TICKFAW RIVER AND TRIBUTARIES, LOUISIANA.

For history of this work, projects, and results accomplished, see current summary, page 412, and Annual Report of the Chief of Engineers for 1906, page 1313.

No work was done during the fiscal year, the amount of funds available being too small for effective work until near the end of the year. The plans for the combined dredge and snag boat to be constructed under the approved project were commenced. The expenditures during the year were for collection of commercial statistics.

*Money statement.*

July 1, 1906, balance unexpended.....	\$33.30
Transferred from "Bogue Chitto," authority Acting Secretary of War.....	157.46
Amount appropriated by river and harbor act approved March 2, 1907.....	6,000.00
	6,190.76
June 30, 1907, amount expended during fiscal year, for maintenance of improvement.....	24.25
July 1, 1907, balance unexpended.....	6,166.51

## APPROPRIATIONS.

March 3, 1881-----	\$2,000.00	March 3, 1905 (allotted)---	\$1,000.00
August 2, 1882-----	2,000.00	March 2, 1907 (allotted)---	6,000.00
August 5, 1886-----	2,000.00		
August 11, 1888-----	1,000.00	Total-----	20,000.00
September 19, 1890-----	1,000.00	April 8, 1907, amount trans-	
July 13, 1892-----	1,000.00	ferred from allotment for	
August 18, 1894-----	1,000.00	“Improving Bogue Chit-	
June 3, 1896-----	1,000.00	to”-----	157.46
March 3, 1899-----	1,000.00		
June 13, 1902 (allotted)---	1,000.00	Total-----	20,157.46

## COMMERCIAL STATISTICS.

[From January 1, 1906, to December 31, 1906.]

*Vessels entering and departing.*

Class.	Number.	Trips.	Net regis- tered tonnage.
Steamers-----	3	537	126
Sailing vessels-----	12	284	287
Barges-----	1	2	100
Total-----	16	773	513

*Receipts and shipments by water.*

Articles.	Tons.	Value.
Lumber-----	28,647	\$275,022
Logs-----	794	8,573
Wood, fuel-----	2,144	8,564
Cotton-----	42	8,400
Hides and wool-----	6	929
Shingles and laths-----	30	1,100
Live stock-----	35	7,000
Rice-----	2	66
Staves-----	630	10,080
Miscellaneous freight-----	2,360	118,000
Total-----	34,690	482,734

## (D) AMITE RIVER AND BAYOU MANCHAC, LOUISIANA.

For history of this work, projects, and results accomplished, see current summary, page 413, and Annual Report of the Chief of Engineers for 1906, page 1314.

No work was done during the fiscal year, the amount of funds available being too small for effective work until near the end of the year. The plans for the combined dredge and snag boat to be constructed under the approved project were commenced. The expenditures during the year were for the collection of commercial statistics.

*Money statement.*

July 1, 1906, balance unexpended.....	\$399. 52
Amount appropriated by river and harbor act approved March 2, 1907..	20,000. 00
	<hr/> 20,399. 52
June 30, 1907, amount expended during fiscal year, for maintenance of improvement.....	22. 50
July 1, 1907, balance unexpended.....	<hr/> 20,377. 02

## APPROPRIATIONS.

June 14, 1880.....	\$8,000. 00	March 2, 1907 (allotted) ..	\$20,000. 00
March 3, 1881.....	5,000. 00		
August 5, 1886.....	2,000. 00	Total.....	61,300. 00
August 11, 1888.....	5,000. 00	February 24, 1903, amount transferred from allotment for "Improving Chefuncte River and Bogue Falia, Louisiana" ..	1,194. 01
September 19, 1890.....	3,800. 00		
July 13, 1892.....	2,500. 00	Total.....	62,494. 01
August 18, 1894.....	2,500. 00		
June 3, 1895.....	2,500. 00		
March 3, 1899.....	2,500. 00		
June 13, 1902 (allotted) ..	2,500. 00		
March 3, 1905 (allotted) ..	5,000. 00		

## COMMERCIAL STATISTICS.

[From January 1, 1906, to December 31, 1906.]

*Vessels entering and departing.*

Class.	Number.	Trips.	Net registered tonnage.
Steamers.....	8	315	296
Sailing vessels.....	26	494	578
Barges.....	2	11	158
Total.....	36	810	1,032

*Shipments and receipts by water.*

Articles.	Tons.	Value.
Lumber.....	24,946	\$239,490
Logs.....	7,578	84,106
Shingles and laths.....	7,832	17,542
Staves.....	4,961	79,800
Cotton and cotton seed.....	2,147	284,856
Hides, furs, wool, and moss.....	16	1,322
Wood, fuel.....	4,217	16,368
Poultry and eggs.....	16	5,013
Live stock.....	22	7,500
Brick and clay.....	1,824	15,072
Miscellaneous freight.....	4,110	205,500
Total.....	50,669	906,229

## T 3.

IMPROVEMENT OF INLAND WATERWAY, FRANKLIN TO MERMENTAU,  
LOUISIANA.

For general project for this work, see current summary, page 415; also House Document No. 640, Fifty-ninth Congress, second session.

Under project approved April 16, 1907, it was proposed to make a survey of location for making borings to determine the nature of material to be encountered along the route and for securing the data necessary for preparation of deeds for right of way and for plans and specifications for the work.

After securing promises from the owners of lands lying along the route between the Mermentau and Vermilion rivers that they would donate the right of way for the proposed channel, the survey was commenced on May 16, but owing to excessive rainfall and the overflowed condition of the land it became necessary to suspend operations on June 13. Five routes for the channel between Bayou Teche and Vermilion Bay have been examined.

*Money statement.*

Amount appropriated by river and harbor act approved March 2, 1907.	\$89,292.00
June 30, 1907, amount expended during fiscal year, for works of improvement .....	1,198.21
July 1, 1907, balance unexpended .....	88,093.79
July 1, 1907, outstanding liabilities .....	306.35
July 1, 1907, balance available .....	87,787.44
Amount (estimated) required for completion of existing project .....	200,000.00
<hr/>	
{ Amount that can be profitably expended in fiscal year ending June 30, 1909, for works of improvement, in addition to the balance unexpended July 1, 1907 .....	
{ Submitted in compliance with requirements of sundry civil act of June 4, 1897.	
	200,000.00

## APPROPRIATIONS.

March 2, 1907 .....	\$89,292
---------------------	----------

## T 4.

## IMPROVEMENT OF CHANNEL, BAY, AND PASSES OF BAYOU VERMILION AND MERMENTAU RIVER AND TRIBUTARIES, LOUISIANA.

## (A) CHANNEL, BAY, AND PASSES OF BAYOU VERMILION.

For history of this work, projects, and results accomplished see current summary, page 416, and Annual Report of the Chief of Engineers for 1905, page 1463.

Between December 13, 1906, and January 13, 1907, the United States steamboat *Ramos* removed 31 snags and cut 175 overhanging

trees between the mouth of Bayou Vermilion and Broussard's bridge, 23 miles above Abbeville. The plans of the combined dredge and snag boat to be constructed under the approved project were commenced.

*Money statement.*

July 1, 1906, balance unexpended.....	\$909. 87
Amount appropriated by river and harbor act approved March 2, 1907.....	7, 000. 00
	<hr/> 7, 909. 87
June 30, 1907, amount expended during fiscal year, for maintenance of improvement .....	827. 75
July 1, 1907, balance unexpended.....	<hr/> 7, 082. 12

APPROPRIATIONS.

June 14, 1880 .....	\$5, 000	December 31, 1903, amount transferred from allotment for "Improving Mermentau River and tributaries, Louisiana ".....	\$200
March 3, 1881 .....	4, 900		
July 13, 1892 .....	7, 500		
August 18, 1894 .....	5, 000		
June 3, 1896 .....	1, 000		
March 3, 1899 .....	2, 500		
June 13, 1902 (allotted) .....	9, 000	Total.....	43, 100
March 3, 1905 (allotted) .....	1, 000		
March 2, 1907 (allotted) .....	7, 000		
Total.....	<hr/> 42, 900		

COMMERCIAL STATISTICS.

[From January 1, 1906, to December 31, 1906.]

*Vessels entering and departing.*

Class.	Number.	Trips.	Net registered tonnage.
Steamers .....	3	128	5, 720

*Shipments and receipts by water.*

Articles.	Tons.	Value.	Articles.	Tons.	Value.
SHIPMENTS.			RECEIPTS.		
Cotton and cotton seed .....	7, 500	\$482, 500	Fuel oil .....	1, 000	\$6, 600
Sugar cane.....	15, 000	60, 000	Brick, sand, and shells .....	2, 500	5, 000
Sugar and molasses .....	2, 000	100, 000	Merchandise .....	750	56, 250
Rice.....	1, 800	70, 000	Lumber .....	875	3, 000
Cattle.....	800	12, 000	Miscellaneous .....	50	2, 000
Cordwood .....	750	8, 000			
Total .....	<hr/> 27, 350	<hr/> 727, 500	Total.....	4, 675	72, 860

Grand total, 32,025 tons, valued at \$800,350.

## (B) MERMENTAU RIVER AND TRIBUTARIES, LOUISIANA.

For history of this work, projects, and results accomplished see current summary, page 417, and Annual Report of the Chief of Engineers for 1906, page 1316.

After advertisement by circular letter and public notice, the proposal of J. B. Streater, of Lake Arthur, La., to furnish the necessary plant and crew for the removal of snags, logs, etc., in Bayou Nezpique for \$47 per day of eight hours' actual work was accepted. Operations were commenced August 21, 1906, and were completed October 6, 1906, after forty-one and three-eighths days' actual work. The bayou was placed in navigable condition for a distance of 21 miles below Viterboville, La., within which distance 345 snags, logs, and other obstructions were removed from the channel.

The plans of the combined dredge and snag boat to be constructed under the approved project were commenced.

*Money statement.*

July 1, 1906, balance unexpended.....	\$2, 526. 72
Amount appropriated by river and harbor act approved March 2, 1907.....	18, 000. 00
	20, 526. 72
June 30, 1907, amount expended during fiscal year, for maintenance of improvement.....	2, 345. 94
July 1, 1907, balance unexpended.....	18, 180. 78

## APPROPRIATIONS.

July 13, 1892.....	\$7, 500. 00
August 18, 1894.....	5, 000. 00
June 3, 1896.....	5, 000. 00
March 3, 1899.....	6, 115. 25
June 13, 1902.....	2, 500. 00
March 3, 1905 (allotted).....	2, 000. 00
March 2, 1907 (allotted).....	18, 000. 00
Total.....	46, 115. 25
December 31, 1903, amount transferred to allotment for "Improving channel, bay, and passes of Bayou Vermillion, Louisiana".....	200. 00
Total.....	45, 915. 25

## COMMERCIAL STATISTICS.

[From January 1, 1906, to December 31, 1906.]

*Vessels entering and departing.*

Class.	Number.	Trips.	Net registered tonnage.
Steamers.....	7	148	5, 000
Sailing vessels.....	7	116	2, 900
Total.....	14	264	7, 900

*Shipments and receipts by water.*

Articles.	Tons.	Value.	Articles.	Tons.	Value.
SHIPMENTS.			RECEIPTS.		
Rice .....	10,498	\$419,920	Fuel oil .....	16,068	\$80,340
Cotton and cotton seed .....	1,240	110,000	Merchandise .....	1,110	83,250
Lumber .....	8,700	29,600	Logs .....	24,000	48,000
Cattle .....	608	24,320	Corn and oats .....	1,500	30,000
Hides and furs .....	67	12,000	Machinery .....	183	14,640
Miscellaneous .....	450	8,600	Fertilizer .....	210	4,200
			Miscellaneous .....	2,000	6,600
Total .....	16,563	599,440	Total .....	45,071	267,030

Grand total, 61,634 tons, valued at \$866,470.

## T 5.

IMPROVEMENT OF MOUTH AND PASSES OF CALCASIEU RIVER,  
LOUISIANA.

For history of this work, projects, and results accomplished see current summary, page 419, and Annual Report of the Chief of Engineers for 1906, page 1318.

The Bowers Southern Dredging Company, under contract dated April 9, 1906, completed the work of dredging the channel at the inner pass on July 25, 1906, and the dredging over the bar at the mouth of Calcasieu River on August 11, 1906. The dredged channels are 100 feet wide and 7 feet deep; the channel at the inner pass was dredged for a length of 24,000 feet and that through the bar at mouth of river for a length of 10,000 feet. The material removed consisted principally of soft blue mud, with a small amount of clam shells and sand, and it was deposited at a distance of about 850 feet east of the dredged channel. A total of 352,778.75 cubic yards was dredged at the contract price of 9.9 cents per cubic yard.

The Bowers Southern Dredging Company completed on August 25, 1906, the placing of 54 pile clusters of 3 creosoted piles each, at the contract price of \$17.60 per pile. These clusters were placed for marking the channel through the lake at intervals of 1,500 feet and at a distance of 100 feet to westward from center line of channel.

Under contract dated April 9, 1906, Charles Clarke & Co. began the work of rebuilding the old revetment at the foot of Calcasieu Lake on July 5, 1906, and completed the work on April 6, 1907. A total of 18,763.04 tons of riprap stone was placed in the revetment at the contract price of \$2.94 per ton, the revetment being rebuilt for a length of 8,230 feet.

The plans of the combined dredge and snag boat to be constructed under the approved project were commenced.

Map is herewith, showing the survey of Calcasieu Lake and Pass made in 1905, also the channels dredged and the revetment and pile clusters placed under contract in 1906.



*Money statement.*

July 1, 1906, balance unexpended.....	\$95, 078. 18
Refundment of overpayment.....	. 45
Amount appropriated by river and harbor act approved March 2, 1907..	25, 000. 00
	<hr/>
June 30, 1907, amount expended during fiscal year, for maintenance of improvement.....	120, 078. 63
	<hr/>
July 1, 1907, balance unexpended.....	95, 080. 63
	<hr/>
July 1, 1907, balance unexpended.....	24, 998. 00

**APPROPRIATIONS.**

June 10, 1872 .....	\$15, 000. 00	June 13, 1902.....	\$75, 000. 00
March 3, 1881.....	15, 000. 00	March 3, 1905.....	100, 000. 00
August 2, 1882.....	10, 000. 00	March 2, 1907.....	25, 000. 00
July 5, 1884.....	6, 500. 00		<hr/>
August 11, 1888.....	10, 000. 00	Total.....	636, 500. 00
September 19, 1890.....	75, 000. 00	Refundment of overpay-	
June 13, 1892.....	100, 000. 00	ment.....	. 45
August 18, 1894.....	90, 000. 00		<hr/>
June 3, 1896.....	80, 000. 00	Total.....	636, 500. 45
March 3, 1899.....	35, 000. 00		

**CONTRACTS IN FORCE.**

Name and address of contractors: Bowers Southern Dredging Company, Galveston, Tex.

Work: Dredging about 312,000 cubic yards and marking channel with pile clusters (about 162 piles).

Unit price: Dredging, 9.9 cents per cubic yard; piles in place, \$17.60 each.

Date of approval: April 24, 1906.

Date of beginning work: May 29, 1906.

Date of expiration of contract: October 28, 1906. Work completed August 25, 1906.

Name of contractors: Charles Clarke & Co., Galveston, Tex.

Work: Rebuilding revetment, about 18,000 tons of riprap stone.

Unit price: \$2.94 per ton in place.

Date of approval: April 27, 1906.

Date of beginning work: July 5, 1906.

Date of expiration of contract: Time limit waived; work completed April 6, 1907.

**COMMERCIAL STATISTICS.**

[From January 1, 1906, to December 31, 1906.]

*Vessels entering and departing.*

Class.	Number.	Trips.	Net registered tonnage.
Steamers.....	7	300	32, 600.
Sailing vessels.....	4	43	1, 833
Barges.....	7	29	7, 639
Total.....	18	372	42, 072

*Shipments and receipts by water.*

Articles.	Tons.	Value.	Articles.	Tons.	Value.
<b>SHIPMENTS.</b>			<b>RECEIPTS.</b>		
Lumber and shingles .....	11,657	\$95,000	Logs .....	286,000	\$858,000
Rice .....	3,000	120,000	Merchandise .....	1,500	112,500
Cotton and cotton seed .....	880	71,425	Fuel oil and coal .....	2,100	10,072
Cord wood .....	4,000	14,000	Machinery .....	150	15,000
Sand and shell .....	4,400	6,600	Feed stuff .....	570	7,380
Hides and furs .....	46	11,000	Miscellaneous .....	122	5,960
<b>Total .....</b>	<b>23,998</b>	<b>318,025</b>	<b>Total .....</b>	<b>290,242</b>	<b>1,008,912</b>

Grand total, 314,235 tons, valued at \$1,326,937.

**T 6.****IMPROVEMENT OF JOHNSONS BAYOU, LOUISIANA.**

For history of this work, project, and results accomplished, see current summary, page 421, and Annual Reports of the Chief of Engineers for 1900, page 2268, and 1905, page 1468.

The act of March 2, 1907, appropriated \$2,500 for the maintenance of the improvement. No estimate was submitted by this office for improvement of Johnsons Bayou, and no project has been prepared.

Further examination will be made to determine whether any work of maintenance is necessary.

*Money statement.*

Amount appropriated by river and harbor act approved March 2, 1907... \$2,500.00  
 July 1, 1907, balance unexpended..... 2,500.00

**APPROPRIATIONS.**

By act of Congress:  
 Approved March 3, 1899..... \$2,500.00  
 Approved March 2, 1907..... 2,500.00  
**Total..... 5,000.00**  
 Reverted to Treasury..... 238.65  
**Net total ..... 4,761.35**

**COMMERCIAL STATISTICS.**

[From January 1, 1906, to December 31, 1906.]

*Vessels entering and departing.*

Kind.	Number.	Trips.	Net registered tonnage.
Gasoline launches .....	2	(a)	(a)
Sailing vessels .....	3	(a)	(a)
Barges .....	4	(a)	(a)
<b>Total .....</b>	<b>9</b>	<b>(a)</b>	<b>(a)</b>

\* No record.

*Shipments and receipts by water.*

Articles.	Tons.	Value.	Articles.	Tons.	Value.
<b>SHIPMENTS.</b>			<b>RECEIPTS.</b>		
Cotton and cotton seed.....	425	\$29,500	Lumber.....	800	\$8,000
Cattle .....	1,000	60,000	Cord wood.....	200	800
Melons and garden truck .....	300	9,000	Merchandise.....	100	7,500
Hides and furs .....	5	6,500	Miscellaneous.....	10	500
Total .....	1,780	105,000	Total.....	1,110	16,800

Grand total, 2,840 tons, valued at \$121,800.

## T 7.

## IMPROVEMENT OF THE MOUTHS OF THE SABINE AND NECHES RIVERS, TEXAS.

For history of this work, projects, and results accomplished, see current summary, page 421, and Annual Report of the Chief of Engineers for 1906, page 1319.

On July 1, 1906, one dredge had completed the channel to the Neches River, a distance of 20,476 feet, but by reason of nonapproval of the deeds for right of way a second dredge was not placed on the work until July 5, 1906, when dredging was commenced at the mouth of Taylors Bayou. For the same reason no payments could be made for work done by this dredge until February, 1907, although the contractors continued work. On April 28, 1907, this dredge again reached a section of the channel for which the deeds of right of way have not been approved by the Department of Justice and, since no payments could be made for work done, the contractors withdrew the dredge from the work. For the same reason the second dredge was withdrawn June 27, 1907.

The total number of cubic yards removed by the two dredges during the fiscal year was 2,440,634.54 cubic yards, at the contract price of 8 cents per cubic yard. The material consisted of hard yellow and blue clay and sand and was deposited behind a levee at an average distance of 200 feet east of the dredged channel, forming a continuous dump.

On June 30, 1907, the length of uncompleted channel immediately in front of the town of Port Arthur was about 15,000 feet.

For the protection of the channel in front of the waterworks at Port Arthur, where the dredged cut lies entirely in Sabine Lake, a creosoted wooden revetment was placed, 2,256 feet long, at the contract price of \$9.20 per linear foot.

After advertisement by circular letter and public notice the proposal of the Bowers Southern Dredging Company to mark the dredged channel between the Sabine and Neches rivers with creosoted pile clusters was accepted. The work was completed in December, 1906, 4 clusters of 5 piles each and 17 clusters of 3 piles each being driven at a cost of \$15.20 per pile.

Map is herewith showing the location of the channel and the lands donated to the United States for right of way.

*Money statement.*

July 1, 1906, balance unexpended.....	\$469,688.51
Sale blueprints .....	2.60
	<hr/> 469,691.11
June 30, 1907, amount expended during fiscal year, for works of improvement.....	227,926.51
	<hr/>
July 1, 1907, balance unexpended.....	241,764.60
July 1, 1907, outstanding liabilities.....	45.00
	<hr/>
July 1, 1907, balance available.....	241,719.60
July 1, 1907, amount covered by uncompleted contracts.....	120,340.31

APPROPRIATIONS.

March 3, 1899.....	\$10,000.00
June 13, 1902.....	125,000.00
June 30, 1906.....	411,500.00
Receipts from sales.....	2.60
	<hr/>
Total.....	546,502.60

CONTRACTS IN FORCE.

Name and address of contractor: Bowers Southern Dredging Company, Galveston, Tex.

Work: Dredging about 4,345,000 cubic yards and building about 5,200 feet of creosoted wooden revetment.

Prices per unit: Dredging, 8 cents per cubic yard; revetment, \$9.20 per linear foot.

Date of approval: January 13, 1906.

Date of beginning work: March 1, 1906.

Date of expiration: Indeterminate.

COMMERCIAL STATISTICS.

[From January 1, 1906, to December 31, 1906.]

*Vessels entering and departing.*

NECHES RIVER.

Class.	Number.	Trips.	Net registered tonnage.
Steamers .....	10	276	3,760
Barges .....	8	216	27,609
Total .....	18	491	31,269

*Shipments and receipts by water.*

Articles.	Tons.	Value.	Articles.	Tons.	Value.
<b>SHIPMENTS.</b>			<b>RECEIPTS.</b>		
Sand, shell, and gravel.....	86,000	\$129,000	Logs.....	60,000	\$120,000
Lumber.....	19,800	168,400	Rice.....	606	24,000
Fuel oil.....	10,580	50,900	Merchandise.....	150	11,250
Spring water.....	1,470	2,500	Produce.....	100	5,000
Total.....	117,800	340,800	Total.....	60,856	160,250

Grand total, 178,656 tons, valued at \$501,050.

*Vessels entering and departing.*

## SABINE RIVER.

Class.	Number.	Trips.	Net registered tonnage.
Steamers.....	5	200	6,200
Sailing vessels.....	2	4	320
Barges.....	11	280	56,000
Total.....	18	484	62,520

*Shipments and receipts by water.*

Articles.	Tons.	Value.	Articles.	Tons.	Value.
<b>SHIPMENTS.</b>			<b>RECEIPTS.</b>		
Lumber.....	62,500	\$505,500	Saw logs.....	336,000	\$672,000
Sand and shells.....	10,000	15,000	Merchandise.....	150	11,250
Rice.....	842	39,800	Bricks, lime, and cement.....	50	500
Cattle.....	900	18,000	Total.....	336,200	683,750
Cotton and cotton seed.....	28	5,100			
Total.....	73,670	585,200			

Grand total, 409,870 tons, valued at \$1,268,950.

## T 8.

## OPERATING AND CARE OF PORT ARTHUR CANAL, TEXAS. .

For history of this work and of its transfer to the United States see current summary, page 424.

Project for the maintenance of the canal during the current fiscal year was approved by the Assistant Secretary of War on March 1, 1907, and \$30,000 was allotted for the work.

On March 6, 1907, a survey was made of the break between the canal and Sabine Lake. Plans for its closure with a creosoted wooden revetment 300 feet long were prepared and emergency contract entered into April 23, 1907, with Spence & Parrish, of Port Arthur, for the work. No work was done until June 28 on account of unusually high stage of the lake.

A comprehensive survey of the canal was made between March 19 and May 10, which consisted of:

(1) Staking out reference lines along each side of canal, lumber and turning basins, parallel to center lines. Stakes were placed every 100 feet and P. C.'s and P. T.'s were marked with galvanized-iron pipe set in concrete.

(2) Leveling from bench mark at Sabine Pass for a distance of 8 miles. Elevations of all pipes determined and 8 staff tide gauges established.

(3) Stadia survey, giving details of lake shore and adjacent topography.

(4) Cross sections of canal and basins taken every 100 feet, a total of 10,250 soundings.

A map is herewith, showing the location and depths of the canal.

The dredge of the Port Arthur Canal and Dock Company was purchased for \$12,000 and turned over to the Government on May 6, 1907. In anticipation of transferring the canal to the United States the company had permitted the dredge to get badly out of repair. New boilers and extensive repairs to machinery and pontoons will be required before the dredge will be available for dredging. Boilers and other new parts have been ordered and repairs are under way.

No commercial statistics were compiled for the year 1906, as the canal was not turned over to the Government until after the end of the year.

#### CONTRACT IN FORCE.

Name and address of contractor: Spence & Parrish, Port Arthur, Tex.

Work: 300 linear feet creosoted wooden revetment.

Price per unit: \$15.11 per linear foot.

Date of approval: Emergency.

Date of beginning work: May 23, 1907.

Date of expiration: Time limit waived.

#### ALLOTMENTS.

March 1, 1907----- \$30,000

*Summary of expenses for operating and care of Port Arthur Canal, Texas, for the fiscal year ending June 30, 1907.*

Surveys and marking reference line-----	\$1,339.33
Purchase and repair of dredge and accessories-----	17,314.66
Construction of revetment-----	4,533.00
Office expenses and administration-----	202.09
Total-----	23,389.08

#### Estimate.

Amount (estimated) for fiscal year ending June 30, 1908-----	\$25,600.00
Balance from allotment for preceding year-----	6,610.92
Additional allotment required for fiscal year ending June 30, 1908---	18,989.08

## T 9.

## IMPROVEMENT OF HARBOR AT SABINE PASS, TEXAS.

For history of this work, projects, and results accomplished see current summary, page 425, and Annual Report of the Chief of Engineers for 1906, page 1322.

*Maintenance of jetty channel.*—The U. S. dredge *Sabine* was operated in the jetty channel from the beginning of the fiscal year to April 30, 1907. On May 1 the dredge was prepared to proceed to New Orleans for the annual overhauling and repairs. When the dredge was docked for repairs it was found that both shafts had developed cracks during the year and new shafts were ordered. At the end of the fiscal year the new shafts had not arrived, delaying the completion of the repairs.

During the year the dredge removed and carried out to sea 490,293 cubic yards of soft blue mud (estimated at 60 per cent of bin measurement) at a total cost of \$23,871.37, including repairs and additions to the dredge and cost of administration, or 4.87 cents per cubic yard.

The distribution of the dredge's time during the year is as follows:

	h.	m.
Working time.....	2, 294	30
Lost time.....	1, 910	40
<b>Total.....</b>	<b>4, 205</b>	<b>10</b>
<b>Distribution of working time:</b>		
Underway .....	824	40
Pumping .....	921	10
Dumping .....	478	05
Taking on fuel oil.....	70	35
<b>Total.....</b>	<b>2, 294</b>	<b>30</b>
<b>Distribution of lost time:</b>		
Rough sea and fog.....	275	55
Sundays and holidays.....	642	0
Washing out boilers.....	92	0
Ordinary repairs.....	217	10
Miscellaneous .....	23	35
Extraordinary repairs (in dry dock and overhauling dredge and machinery at New Orleans, La.).....	660	0
<b>Total.....</b>	<b>1, 910</b>	<b>40</b>

The cost of the work during the year was \$23,871.37, distributed as follows:

Wages of crew.....	\$9, 910. 91
Wages of subsistence department.....	892. 50
Office expenses.....	1, 125. 03
Subsistence supplies.....	2, 767. 39
Fuel oil.....	5, 692. 46
Deck and engine room supplies.....	1, 234. 01
Ordinary repairs.....	1, 288. 20
Extraordinary repairs.....	594. 51
Miscellaneous supplies.....	366. 36
<b>Total cost of dredging.....</b>	<b>23, 871. 37</b>

*Survey.*—The hydrographic survey of the harbor and jetty channel, commenced June 16, 1906, was completed July 10. The plotted soundings show very little change in the channel since the survey of 1904, for which reason the map is not submitted. (For map of harbor and jetty channel see Annual Report for 1904, page 1920.)

*Money statement.*

July 1, 1906, balance unexpended.....	\$39, 335. 05
Sale of condemned property.....	604. 02
Sale of blueprints.....	5. 50
Amount appropriated by river and harbor act approved March 2, 1907.....	160, 000. 00
Reimbursement for damages to dredge.....	80. 00
	<hr/> 200, 024. 57
June 30, 1907, amount expended during fiscal year:	
For works of improvement.....	\$14, 209. 30
For maintenance of improvement.....	26, 994. 77
	<hr/> 41, 204. 07
July 1, 1907, balance unexpended.....	158, 820. 50
July 1, 1907, outstanding liabilities.....	3, 287. 41
	<hr/> 155, 553. 09
July 1, 1907, balance available.....	<hr/> 155, 553. 09
Amount (estimated) required for completion of existing project.....	<hr/> 826, 573. 00
Amount that can be profitably expended in fiscal year ending June 30, 1909, in addition to the balance unexpended July 1, 1907:	
For works of improvement.....	\$300, 000. 00
For maintenance of improvement.....	100, 000. 00
	<hr/> 400, 000. 00
Submitted in compliance with requirements of sundry civil act of June 4, 1897, and of section 7 of the river and harbor act of 1899.	

APPROPRIATIONS.

August 30, 1852 (survey).....	\$5, 000. 00	July 1, 1898.....	\$400, 000. 00
June 10, 1873 (survey).....	2, 000. 00	March 3, 1899.....	264, 000. 00
March 3, 1875.....	20, 000. 00	March 3, 1899.....	150, 000. 00
August 14, 1876.....	38, 000. 00	June 6, 1900.....	38, 000. 00
June 18, 1878 (allotted).....	30, 000. 00	June 6, 1900 (allotted).....	10, 000. 00
March 3, 1879.....	25, 000. 00	June 13, 1902.....	185, 000. 00
June 14, 1880.....	50, 000. 00	March 3, 1905.....	150, 000. 00
March 3, 1881.....	150, 000. 00	March 2, 1907.....	160, 000. 00
August 2, 1882.....	150, 000. 00		
July 5, 1884.....	200, 000. 00	Total.....	<hr/> 3, 949, 750. 00
August 5, 1886.....	198, 750. 00	Reverted to Treasury	
August 11, 1888.....	250, 000. 00	from act of June 4,	
September 19, 1890.....	300, 000. 00	1897.....	16, 297. 03
July 13, 1892.....	350, 000. 00		
August 18, 1894.....	<sup>a</sup> 271, 000. 00	Net total.....	<hr/> 3, 933, 452. 97
June 3, 1896.....	75, 000. 00	Amount received from	
June 4, 1897.....	480, 000. 00	other sources.....	2, 979. 55
			<hr/>
		Total.....	<hr/> 3, 936, 432. 52

<sup>a</sup> The total amount of this appropriation was originally \$275,000, but of this sum \$4,000 was allotted by sundry civil act of March 2, 1895, for dredging through a bar at the mouth of the Sabine River, Texas, and was expended on that improvement.



## CONTRACTS IN FORCE.

Name and address of contractor: Higgins Oil and Fuel Company, Beaumont, Tex.

Work: Furnishing about 3,500 barrels of fuel oil for *Sabine*.

Contract price: 72½ cents per barrel.

Date of approval: Emergency contract, dated April 2, 1906.

Date of beginning: April 5, 1906.

Date of expiration: October 2, 1906; completed.

Name and address of contractor: Higgins Oil and Fuel Company, Beaumont, Tex.

Work: Furnishing about 3,500 barrels of fuel oil for *Sabine*.

Contract price: 90 cents per barrel.

Date of approval: Emergency contract, dated October 2, 1906.

Date of beginning: October 2, 1906.

Date of expiration: April 2, 1907; completed.

Name and address of contractor: Higgins Oil and Fuel Company, Beaumont, Tex.

Work: Furnishing about 3,500 barrels of fuel oil for *Sabine*.

Contract price: \$1.12 per barrel.

Date of approval: Emergency contract, dated April 6, 1907.

Date of beginning: April 2, 1907.

Date of expiration: October 2, 1907.

## COMMERCIAL STATISTICS.

[From January 1, 1906, to December 31, 1906.]

*Vessels entering and departing.*

Class.	Number.	Trips.	Net registered tonnage.
Steamers .....	111	452	827,733
Sailing vessels .....	50	71	76,192
Barges .....	21	184	290,175
Total .....	182	707	1,194,100

*Shipments and receipts by water.*

Articles.	Tons.	Value.	Articles.	Tons.	Value.
SHIPMENTS.			RECEIPTS.		
Crude petroleum .....	931,010	\$3,724,028	Cresote oil .....	5,476	\$136,900
Refined petroleum .....	569,475	6,378,125	Coal .....	2,100	8,400
Lumber, logs, etc. ....	246,732	2,467,320	Machinery, iron, barrels, etc .....	1,200	90,000
Corn, wheat, and rice .....	72,541	1,406,108	Cement .....	80	800
Cotton and cotton-seed meal .....	81,308	5,155,640	Miscellaneous .....	20	1,500
Asphalt, pitch, and paint .....	29,318	\$70,900			
Staves, shingles, and laths .....	2,208	29,440	Total .....	8,876	287,600
Riprap stone .....	12,279	24,558			
Miscellaneous merchandise .....	254	19,050			
Sulphur .....	360	7,200			
Flour .....	28	1,450			
Total .....	1,895,513	19,582,819			

Grand total, 1,904,389 tons, valued at \$19,820,419.

## T 10.

## REMOVING THE WATER HYACINTH, LOUISIANA AND TEXAS.

For history of this work, projects, and results accomplished see current summary, page 427, and Annual Report of the Chief of Engineers for 1906, page 1324.

The steamer *Ramos* began the work of spraying water hyacinths in the Plaquemine-Morgan City water route on July 14, 1906, having left New Orleans for this purpose on July 7. Operations were continued by this steamer until August 31 in Bayou Plaquemine, Bay Grossetete, Bayou Grossetete, Bayou Choctaw, Grand River, Belle River, Bayou Long, and Bayou Goddell.

The new steamboat *Hyacinth*, completed in February, 1906, and equipped for the destruction of water hyacinths, left New Orleans September 5, 1906, and arrived at Morgan City, La., September 10. Spraying was carried on in Bayous Black and Blue (St. Mary Parish) for several days, relieving the obstructed condition in these streams. The *Hyacinth* then relieved the *Ramos* and continued the destruction of the plants in the streams of the Plaquemine-Morgan City route and in Bayou Boeuf (St. Mary Parish) until October 14, when the condition of this route warranted the suspension of spraying and she returned to New Orleans and was placed out of commission. The operation of the hyacinth boom in Bayou Plaquemine at Indian Village was discontinued for the season on October 15, 1906.

The *Ramos* was docked at Morgan City, La., early in September and her hull calked and stiffened preparatory to proceeding, via the Gulf of Mexico, to the Sabine River, Texas. The *Ramos* left September 7 and arrived at Orange, Tex., on the Sabine River, September 11. Cow Bayou, a tributary of the Sabine, was completely blocked by water hyacinths and navigation was impossible. Spraying was carried on in this bayou until October 15, resulting in the removal of the obstructions. After a few days lost waiting for favorable weather, the *Ramos* arrived at Lake Charles, La., on the Calcasieu River, October 23.

Spraying was carried on in this river and its tributary, English Bayou, until November 12, when, on account of cool weather, the work was discontinued. By reason of stormy weather, it was December 11 before the *Ramos* could venture into the Gulf for the run to Bayou Vermilion, and it was necessary to hire a tug to tow her. It was too late in the season for effective spraying in this stream, and only the chemicals already mixed in the tanks were used. The steamboat was used for removing snags, etc., in Bayou Vermilion, returning to New Orleans January 20, 1907.

The use of the new solution referred to in the Annual Reports for 1905 and 1906 was continued with excellent results. During the season of 1906, 212,118 gallons of chemical compounds were sprayed in Louisiana streams and 53,616 gallons in Texas streams. The cost of the solution increased from \$0.0034 per gallon in July to \$0.0061 in December, due to an increase in the market price of arsenic.

There were no killing frosts during the winter of 1906-7 in southern Louisiana, and very early in the spring complaints were received of streams obstructed by water hyacinths. The *Ramos* began opera-

tions in the Plaquemine-Morgan City route on April 15 and continued work in the various streams of this route to June 26, 1907.

The *Hyacinth* began operations April 22 in Bayou Des Allemands, where the plants were massed from bank to bank between Lake Des Allemands and Mud Lake, rendering the passage of boats and rafts impossible. Operations were continued in this bayou and in Bayou Boeuf and Grand Bayou (Lafourche Parish) until June 17, when the condition of these streams warranted a discontinuance and the *Hyacinth* was returned to New Orleans.

The operation of the hyacinth boom in Bayou Plaquemine was resumed March 11, 1907.

### *Money statement.*

July 1, 1906, balance unexpended.....	\$24,666.94
Amount appropriated by river and harbor act approved March 2, 1907.....	10,000.00
	<hr/>
	34,666.94
June 30, 1907, amount expended during fiscal year, for works of improvement.....	13,819.45
	<hr/>
July 1, 1907, balance unexpended.....	20,847.49
July 1, 1907, outstanding liabilities.....	773.19
	<hr/>
July 1, 1907, balance available.....	20,074.30

### APPROPRIATIONS.

March 3, 1899.....	\$36,000.00	Receipts from sales (condemned property).....	\$4.16
March 6, 1902 (allotted).....	18,000.00	Reimbursement for damages to hyacinth boom.....	102.53
September 26, 1902 (allotted).....	1,480.00		
December 4, 1903 (allotted).....	500.00	Grand total.....	121,086.69
April 28, 1904 (allotted).....	15,000.00		
March 3, 1905.....	40,000.00		
March 2, 1907.....	10,000.00		
Total.....	120,980.00		



## APPENDIX U.

### IMPROVEMENT OF CERTAIN RIVERS AND HARBORS IN TEXAS.

REPORT OF CAPT. JOHN C. OAKES, CORPS OF ENGINEERS, OFFICER  
IN CHARGE, FOR THE FISCAL YEAR ENDING JUNE 30, 1907.

#### IMPROVEMENTS.

- |   |  |
|---|--|
| 1. Galveston Harbor, Texas.   | 9. Inland waterway—West Galveston Bay and Brazos River Canal; channel from Aransas Pass to Pass Cavallo, including Guadalupe River; Turtle Cove from Aransas Pass to Corpus Christi. |
| 2. Galveston channel, Texas.  | 10. Mouth of Brazos River, Texas.  |
| 3. Channel from Galveston Harbor to Texas City, Texas.  | 11. Aransas Pass, Texas.   |
| 4. Channel to Port Bolivar, Texas.  | 12. Harbor at Brazos Santiago, Texas.  |
| 5. Galveston ship channel and Buffalo Bayou, Texas.   | 13. Construction of sea wall, etc., along the front of the Fort Crockett Reservation and from Thirty-ninth to Forty-fifth streets, Galveston, Texas.                                 |
| 6. Operating and care of Morgans Canal, Texas.  | 14. Operation of dredges.  |
| 7. West Galveston Bay, Texas, and the mouths of the adjacent streams, including Trinity River, Anhuac channel, Cedar Bayou, Chocolate Bayou, and Bastrop Bayou. |  |
| 8. Operating and care of Galveston and Brazos Canal, Texas.   |  |

UNITED STATES ENGINEER OFFICE,  
*Galveston, Tex., July 8, 1907.*

GENERAL: I have the honor to forward herewith annual reports for the works of river and harbor improvements in my charge for the fiscal year ending June 30, 1907.

Very respectfully, your obedient servant,

JOHN C. OAKES,  
*Captain, Corps of Engineers.*

Brig. Gen. A. MACKENZIE,  
*Chief of Engineers, U. S. A.*

#### U I.

### IMPROVEMENT OF GALVESTON HARBOR, TEXAS.

#### OPERATIONS DURING THE YEAR.

#### JETTIES.

*South jetty.*—Operations under contract with Charles Clarke & Co., of Galveston, Tex., were resumed July 23, 1906, and were completed September 20, 1906.

The contractor delivered and placed between station 220 and station 348, 9,647.12 tons of large riprap, at \$3.44 per ton, \$33,186.09, and 1,298.55 tons of small riprap, at \$3.07 per ton, \$3,986.55. The jetty was practically completed between stations 220 and 348.

During the year the shore branch between stations 6 and 138 was repaired by hired labor at a cost of \$3,307.78. Caps and ties were removed in short sections, and sandstone riprap previously placed was rehandled to make a bed for granite crest pieces stored alongside, of which about 13,000 tons were handled. Caps and ties were then replaced.

Repairs to south jetty are completed for about 75 per cent of its length.

With the money now available it is proposed to complete the repairs and extend the jetty approximately 900 feet. Specifications for this extension have been prepared and submitted.

*North jetty.*—No work has been done during the year. With the money now available it is intended to fill the voids in crest of the north jetty. Specifications have been prepared and submitted.

#### DREDGING.

[By United States dredge *Gen. C. B. Comstock*.]

On July 1, 1906, the dredge was laid up for repairs, but owing to the breakdown of the Galveston Marine Ways, she had to proceed to New Orleans to be dry docked. A thorough overhauling of hull and machinery was entered upon, including the stripping of hull of old copper, caulking and resheathing with new copper, new drags and suction pipes, new boiler furnaces, extra oil and water tanks, new tail shaft, and direct-connected generator, etc., at a total cost of \$25,983.62.

The dredge returned to Galveston and was in commission by the 18th of October, 1906.

During the fiscal year the dredge excavated and dumped 1,104,407 cubic yards of material from the outer and inner bars at an operating cost of 4.28 cents per cubic yard. A consolidated report of the operations of the dredge for the entire year will be found in Appendix 14 of this report.

With the money now available it is intended to operate dredge *Comstock* during the year and to begin the construction of a larger sea-going dredge.

A résumé of the work of this dredge since her construction will be found in Appendix 14 of this report.

#### SURVEYS.

Map of the latest survey is submitted herewith.

307  
306  
305  
304  
303

THE NORRIS PETERS CO., WASHINGTON, D. C.





*Money statement.*

July 1, 1906, balance unexpended.....	\$281,069.85
Amount appropriated by river and harbor act approved March 2, 1907.....	300,000.00
Proceeds of sales of condemned property.....	1,043.25
Proceeds of sales of charts of Galveston Bay.....	127.75
Proceeds of sales of contact prints.....	1.20
	<hr/> 532,242.05
June 30, 1907, amount expended during fiscal year:	
For works of improvement.....	\$125,278.67
For maintenance of improvement.....	77,281.14
	<hr/> 202,559.81
July 1, 1907, balance unexpended.....	329,682.24
July 1, 1907, outstanding liabilities.....	7,277.55
	<hr/> 322,404.69
Amount (estimated) required for completion of existing project.....	<hr/> 700,000.00
<hr/>	
{ Amount that can be profitably expended in fiscal year ending June 30, 1909, for works of improvement, in addition to the balance unexpended July 1, 1907.....	1,250,000.00
{ Submitted in compliance with requirements of sundry civil act of June 4, 1897.	

## APPROPRIATIONS.

July 11, 1870.....	\$25,000.00	Transferred to Galveston channel.....	\$50,000.00
March 3, 1871.....	20,000.00		
June 10, 1872.....	31,000.00		
June 23, 1874.....	60,000.00		8,978,000.00
March 3, 1875.....	150,000.00	In addition to the above appropriations by Congress the following amounts have been received:	
August 14, 1876.....	142,000.00	Collected from steamer <i>Mara-time</i> .....	300.00
June 7, 1878.....	75,000.00	Collected from Quartermaster's Department, U. S. Army.....	719.83
June 18, 1878.....	50,000.00	Proceeds of sales of condemned property.....	1,584.55
March 3, 1879.....	100,000.00	Transfer of tug <i>Anna</i> .....	10,000.00
June 14, 1880.....	175,000.00	Refundments of overpayments.....	15.36
March 3, 1881.....	250,000.00	Receipts from sales of charts of Galveston Bay.....	127.75
March 4, 1882.....	100,000.00	Receipts from sales of contact prints.....	1.20
August 2, 1882.....	300,000.00		
August 5, 1886.....	300,000.00		
August 11, 1888.....	500,000.00		
September 19, 1890.....	500,000.00		
March 3, 1891.....	600,000.00		
August 5, 1892.....	450,000.00		
March 3, 1893.....	1,000,000.00		
August 18, 1894.....	600,000.00		
January 25, 1895.....	200,000.00		
March 2, 1895.....	1,160,000.00		
February 28, 1896.....	300,000.00		
June 3, 1896.....	50,000.00		
June 11, 1896.....	840,000.00		
June 4, 1897.....	500,000.00		
March 3, 1899.....	50,000.00		
June 13, 1902.....	350,000.00		
March 3, 1903.....	300,000.00		
April 23, 1904.....	100,000.00		
March 3, 1905.....	200,000.00		
June 30, 1906.....	250,000.00		
March 2, 1907.....	300,000.00		
Total.....	10,028,000.00	Total.....	9,990,748.69

## CONTRACT IN FORCE.

Contractor: Charles Clarke & Co., Galveston, Tex.

Character of work: Repairing jetties.

Rate: Large riprap in pieces from 10 to 12 tons each, properly placed in the work, \$3.44 per ton. Small riprap, properly placed in the work, \$3.07 per ton.

Date of approval: September 25, 1905.

Date of beginning work: January 1, 1906.

Date of expiration: March 11, 1906. (Time limit waived.) Contract completed September 20, 1906.

## COMMERCIAL STATISTICS.

All the commerce of Galveston channel, Texas City channel, and Galveston Ship channel and Buffalo Bayou which comes in from or goes out to the Gulf, whether coastwise or foreign, passes through the jetty channel. For statistics see pages 1457-1458.

## U 2.

## IMPROVEMENT OF GALVESTON CHANNEL, TEXAS.

At the beginning of fiscal year the channel between Red Beacon and Forty-fourth street was 550 feet wide and approximately 30 feet deep. During the fiscal year 1,138,318 cubic yards of material were dredged by the United States, of which 404,981 cubic yards were charged to maintenance and 733,337 cubic yards to new work in widening channel.

The U. S. dredge *Col. A. M. Miller* removed 404,981 cubic yards of material in maintaining channel at a cost of 3.9 cents per cubic yard; also 534,727 cubic yards from new cut adjacent to and north of above-described channel at 4.17 cents per cubic yard; the U. S. dredge *Gen. H. M. Robert* removed 198,610 cubic yards of material from the above-described new cut at a cost of 5.38 cents per cubic yard.

In addition to work done by the Government, the Galveston Wharf Company removed 65,260 cubic yards of material from a strip 75 feet wide in front of their wharves and the Southern Pacific Company removed 102,379 cubic yards from a strip immediately north of the harbor line and parallel thereto in front of their property.

A consolidated report of the operations of the dredges *Col. A. M. Miller* and *Gen. H. M. Robert* for the entire year will be found in Appendix 14 of this report.

The record of fill and scour is as follows:

	Cubic yards.
Fill in channel this year.....	335, 800
Scour in channel this year.....	107, 400
Net fill in channel this year.....	227, 800
Total fill as per last report.....	1, 051, 000
Total fill to date.....	1, 278, 800

The shoaling and scouring of the channel was very evenly distributed, no part showing any tendency to shoal or scour abnormally.

## SURVEYS.

Map \* of latest survey is submitted herewith.

\* Not printed.

*Money statement.*

July 1, 1906, balance unexpended.....	\$50,086.72
Amount appropriated by river and harbor act approved March 2, 1907.....	200,000.00
Proceeds of sales of condemned property.....	21.88
Proceeds of sales of contact prints.....	1.05
Rental of dredge <i>Miller</i> .....	169.97
Refundment of overpayment.....	.59
	<hr/> 250,280.21
June 30, 1907, amount expended during fiscal year:	
For works of improvement.....	\$35,056.29
For maintenance of improvement.....	19,702.15
	<hr/> 54,758.44
July 1, 1907, balance unexpended.....	195,521.77
July 1, 1907, outstanding liabilities.....	6,213.96
	<hr/> 189,307.81
July 1, 1907, balance available.....	<hr/> 189,307.81
Amount (estimated) required for completion of existing project....	1,017,935.75
	<hr/> <hr/>
Amount that can be profitably expended in fiscal year ending June 30, 1909, for works of improvement, in addition to the balance unexpended July 1, 1907.....	300,000.00
Submitted in compliance with requirements of sundry civil act of June 4, 1897.	

## APPROPRIATIONS.

June 13, 1902.....	\$100,000.00
March 3, 1903.....	200,000.00
April 28, 1904 (allotted).....	20,000.00
March 3, 1905.....	175,000.00
Amount diverted from Galveston Harbor.....	50,000.00
March 2, 1907.....	200,000.00
Total.....	<hr/> 745,000.00
In addition to the above appropriations by Congress the following additional amounts have been received:	
Proceeds of sales of condemned property.....	25.28
Refundment of overpayment.....	.59
Receipts from sales of contact prints.....	1.05
Rental of dredge <i>Miller</i> .....	169.97
Total.....	<hr/> 745,196.89

## COMMERCIAL STATISTICS OF GALVESTON, TEX., FOR THE CALENDAR YEAR ENDING DECEMBER 31, 1906.

[Furnished by collector of customs, Port of Galveston, Tex.]

*Vessels and revenue collected.*

Class.	Number entered.	Number cleared.	Total.
FOREIGN-BOUND VESSELS.			
Steamers.....	835	539	934
Sailing vessels.....	6	8	14
COASTWISE VESSELS.			
Steamers.....	445	326	771
Sailing vessels.....	40	29	69

Duties on imports collected.....	\$627,423.21
All money collected at custom-house, port of Galveston.....	719,485.62

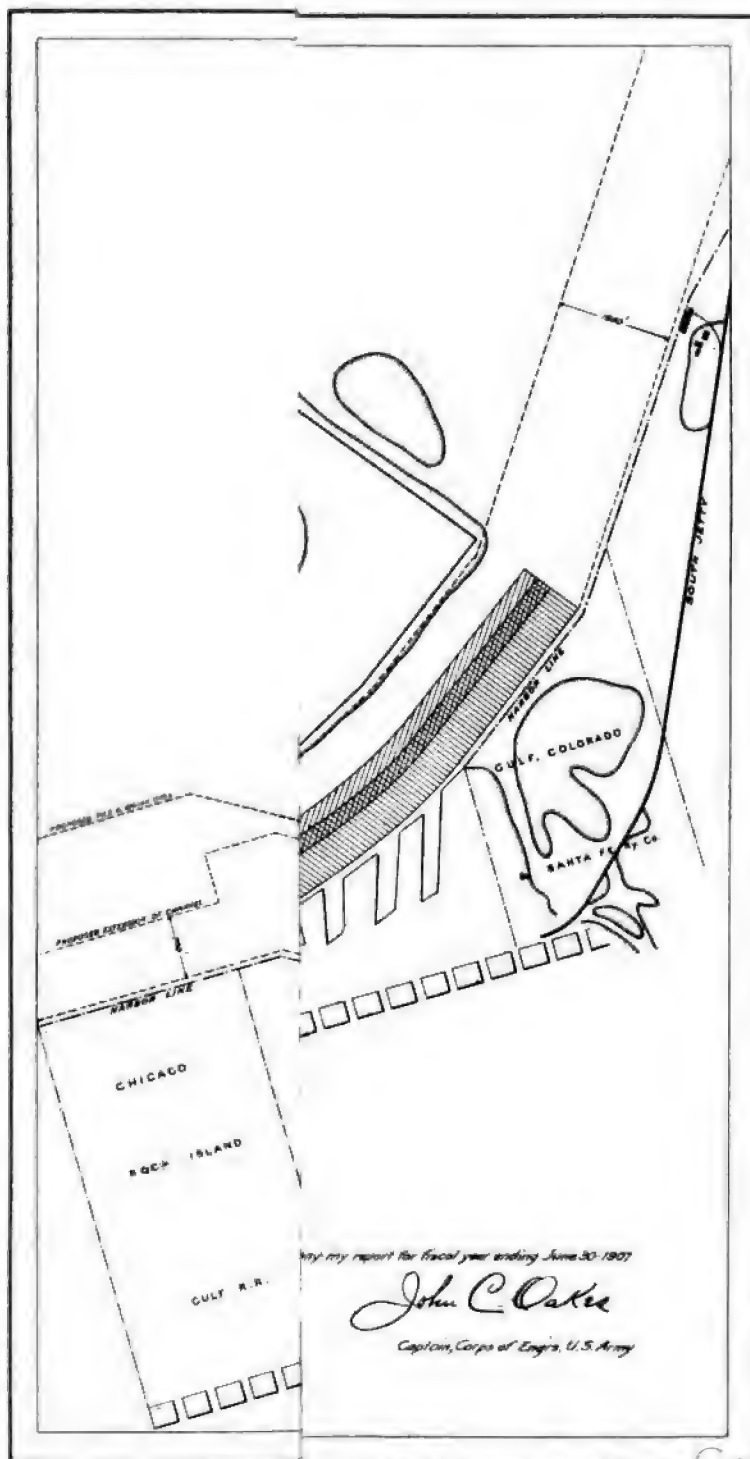
# 1458 REPORT OF THE CHIEF OF ENGINEERS, U. S. ARMY.

## Amount and value of foreign exports and imports.

Articles.	Tons.	Approximate value.
<b>EXPORTS.</b>		
Cotton (2,587,420 bales) .....	670,802	\$142,481,748
Cotton products.....	243,784	7,176,388
Grain .....	599,766	18,401,088
General merchandise .....	32,675	3,779,339
Flour.....	40,458	1,584,518
Lumber and manufactures of wood .....	101,656	1,364,670
Manufactures of iron and steel.....	4,462	135,044
Cattle and other animals.....	14,456	810,308
Cement .....	54	479
Petroleum .....	1,883	28,797
Ore.....	1,598	47,910
<b>Total exports</b> .....	<b>1,710,844</b>	<b>170,759,289</b>
<b>IMPORTS.</b>		
Sugar .....	4,698	244,717
General merchandise .....	24,644	3,106,564
Coal.....	648	2,146
Cement .....	16,636	112,157
Petroleum .....	9,785	81,111
Manufactures of iron and steel .....	1,057	75,721
Wool.....	897	122,441
Lumber and manufactures of wood .....	1,997	22,645
Ore .....	86	4,563
Cattle and other animals .....	1	5
<b>Total imports</b> .....	<b>59,898</b>	<b>3,772,090</b>
<b>Total exports and imports</b> .....	<b>1,770,737</b>	<b>174,531,359</b>

## Amount and value of domestic shipments and receipts.

Articles.	Tons.	Approximate value.
<b>SHIPMENTS.</b>		
Cotton (571,628 bales) .....	147,520	\$32,586,708
Ore.....	30,898	21,693,450
Wool.....	18,061	8,591,470
Sugar .....	104,789	10,476,400
General merchandise .....	84,960	63,181,763
Grain .....	100	10,000
Lumber and manufactures of wood .....	12,281	204,892
Manufactures of iron and steel.....	221	11,250
Flour .....	173	8,248
Cotton products.....	4,794	484,860
<b>Total</b> .....	<b>408,757</b>	<b>187,199,041</b>
<b>RECEIPTS.</b>		
Coal.....	43,415	278,231
General merchandise .....	298,777	208,806,506
Manufactures of iron and steel .....	79,506	3,118,760
Cement .....	5,092	66,920
Petroleum .....	40	1,600
Wool .....	31	15,750
Sugar .....	80	3,000
Lumber and manufactures of wood .....	80	1,200
<b>Total</b> .....	<b>426,971</b>	<b>212,286,966</b>
<b>Grand total</b> .....	<b>831,728</b>	<b>349,486,007</b>
<b>Grand total, exports and imports and shipments and receipts</b> .....	<b>2,602,465</b>	<b>524,017,366</b>



May 1907 report for fiscal year ending June 30, 1907

*John C. Oake*

Captain, Corps of Engineers, U.S. Army



## U 3.

## IMPROVEMENT OF CHANNEL FROM GALVESTON HARBOR TO TEXAS CITY, TEXAS.

## OPERATIONS DURING THE YEAR.

This channel was dredged by the United States May 25, 1905, to 25 feet or greater. To March 14, 1906, the channel filled 984,300 cubic yards. Between February 1 and May 28, 1906, the dredge *Texas City*, in the employ of the Texas City Transport Company, removed 698,222 cubic yards of material, restoring channel to full width of 100 feet on the bottom and 23 to 25 feet deep, and widening same at the inshore bends between stations 1 and 4.

From May 28, 1906, to June 18, 1907, the channel filled 353,400 cubic yards, the greater amount having taken place between the Texas City wharves and Half Moon channel opening, a distance of 13,100 feet.

A contract has been entered into with John Jacobson, of Texas City, Tex., to restore the channel to the original width and a depth of 23 feet between station 18 and Texas City wharves, at \$1.74 per linear foot of channel.

Work to begin on or about July 1, 1907.

No work has been performed during the year except cross sectioning the channel.

*Money statement.*

Amount appropriated by river and harbor act approved March 2, 1907.	\$60,000.00
June 30, 1907, amount expended during fiscal year for maintenance of improvement	158.68
July 1, 1907, balance unexpended	59,841.32
July 1, 1907, outstanding liabilities	45.88
July 1, 1907, balance available	59,795.44
July 1, 1907, amount covered by uncompleted contracts	31,320.00
<hr/>	
{ Amount that can be profitably expended in fiscal year ending June 30, 1909, for works of improvement, in addition to the balance unexpended July 1, 1907	40,000.00
{ Submitted in compliance with requirements of sundry civil act of June 4, 1897.	

## APPROPRIATIONS.

March 3, 1899	\$250,000
March 2, 1907	60,000
Total	310,000

## CONTRACTS IN FORCE.

[Emergency contract.]

Contractor: John Jacobson, Texas City, Tex.  
 Character of work: Dredging.  
 Rate: \$1.74 per linear foot.  
 Date of beginning work: July 20, 1907.  
 Date of expiration: November 20, 1907.

# 1460 REPORT OF THE CHIEF OF ENGINEERS, U. S. ARMY.

COMMERCIAL STATISTICS OF TEXAS CITY, TEX., FOR THE YEAR ENDING  
DECEMBER 31, 1906.

[Furnished by collector of customs, Port of Galveston, Tex.]

*Amount and value of foreign exports and imports.*

Articles.	Tons.	Approximate value.
<b>EXPORTS.</b>		
Cotton (4,864 bales) .....	1,268	\$281,976
Cotton products .....	3,868	92,443
Grain .....	16,819	350,345
General merchandise .....	3,570	\$71,845
Lumber and manufactures of wood .....	16,277	306,152
Manufactures of iron and steel .....	2,070	121,168
Cattle and other animals .....	1,552	206,047
Petroleum .....	77	949
Flour .....	1	47
Total exports .....	44,987	1,736,914
<b>IMPORTS.</b>		
General merchandise .....	13,268	1,960,813
Manufactures of iron and steel .....	3	30
Total imports .....	13,271	1,960,843
Total exports and imports .....	58,258	3,697,757

The Texas City Terminal Company of Texas City, Tex., gives the commerce of this port for the same period as 84,315 tons, valued at \$5,738,094.

## U 4.

### IMPROVEMENT OF CHANNEL TO PORT BOLIVAR, TEXAS.

No work done. Contract awarded to John Jacobson, at 9½ cents per cubic yard, to be completed January 20, 1908.

#### *Money statement.*

Amount appropriated by river and harbor act approved March 2, 1907.	\$50,000.00
June 30, 1907, amount expended during fiscal year, for works of improvement .....	165.58
July 1, 1907, balance unexpended .....	49,834.42
July 1, 1907, outstanding liabilities .....	5.00
July 1, 1907, balance available .....	49,829.42
July 1, 1907, amount covered by uncompleted contracts .....	41,625.00
Amount that can be profitably expended in fiscal year ending June 30, 1909, for maintenance of improvement, in addition to the balance unexpended July 1, 1907 .....	15,000.00
Submitted in compliance with requirements of sundry civil act of June 4, 1897, and of section 7 of the river and harbor act of 1899.	

#### APPROPRIATION.

March 2, 1907.....\$50,000



## CONTRACTS IN FORCE.

[Emergency contract.]

Contractor: John Jacobson, Texas City, Tex.

Character of work: Dredging.

Rate: 9½ cents per cubic yard.

Date of beginning work: July 20, 1907.

Date of expiration: January 20, 1908.

## U 5.

## IMPROVEMENT OF GALVESTON SHIP CHANNEL AND BUFFALO BAYOU, TEXAS.

## OPERATIONS DURING THE YEAR.

Active operations were carried on during the fiscal year under contract with August Nelson, of New York, and by the U. S. dredges *Col. A. M. Miller* and *Gen. H. M. Robert*.

One million five hundred and three thousand two hundred and twenty-six cubic yards were excavated during the year, of which 1,336,086 cubic yards was new work, 40,000 cubic yards maintenance, and 127,140 cubic yards rehandled.

The work performed in the different sections was as follows:

*Division 1, lower bay.*—No work was done.

From April 26, 1906, to June 24, 1907, the channel filled to the extent of about 1,175,000 cubic yards, making a total fill in this section of 2,764,000 cubic yards since the channel was dredged.

*Upper bay.*—No work was done.

From April 26, 1906, to June 18, 1907, the channel filled up to the extent of about 790,000 cubic yards, making a total fill in this section of 2,547,000 cubic yards since the channel was dredged.

For operating and care of Morgans Canal, which is a part of this division, see page 1464 of this report.

*Division 2 (river).*—The U. S. dredge *Gen. H. M. Robert* continued work on Harrisburg cut-off and removed 176,900 cubic yards to December 27, 1906, at a cost of 17.64 cents per cubic yard for operating and maintenance.

The contract price for work adjacent to this cut was 19.9 cents per cubic yard.

These large cost prices are due to the height of banks and difficulties with settling basins, which require sluiceways and have to be protected by levees.

The material was pumped to heights between 30 and 43 feet.

The contractor's dredge *Washington*, from Division 3, excavated 35,478 cubic yards in the lower end of Harrisburg cut-off in Division 2 at contract price of 19.9 cents per cubic yard.

The U. S. dredge *Gen. H. M. Robert* was replaced by the U. S. dredge *Col. A. M. Miller* at the south end of the cut, and then started work on the north end of the cut. (See Division 3.)

The U. S. dredge *Col. A. M. Miller* commenced January 3, 1907, and removed 119,600 cubic yards of new material at a cost of 25.07 cents and 40,000 cubic yards of material in maintaining channel at a cost of 9.07 cents per cubic yard.

The *Miller's* pump casing had been badly cracked for some time, and the pump's capacity was greatly reduced. A new pump casing had been ordered July 17, 1906, to be delivered in four months, but was not delivered until April 15, 1907. As the casing was promised from week to week, the *Miller* was kept in commission in order to maintain the organization of its crew.

To this cause and natural conditions of banks, etc., is due the high unit price.

A consolidated report of the operations of the dredges for the entire year will be found in Appendix 14 of this report.

Between April, 1906, and April, 1907, this division silted 289,000 cubic yards and scoured 94,000 cubic yards.

	Cubic yards.
Total fill this year.....	289,000
Total scour this year.....	94,000
Net fill this year.....	195,000
Total fill last report.....	467,000
Total fill since dredging.....	662,000

A severe flood occurred in May, 1907, during which a rise of 27 feet was recorded at Houston and 16½ feet at Harrisburg. While in general this flood scoured the channel, its effect on the navigability was bad, due to sluffing of banks of the cut-offs and the shoaling of several bars.

Satisfactory deeds have been secured from 56 property owners, about 65 per cent of bayou frontage of this division, or 28½ miles out of a possible 43½ required; additional deeds covering 20 per cent of the frontage have been provisionally accepted. These deeds contain limitations and are not entirely satisfactory to the United States.

*Division 3.*—Contractor August Nelson, of New York, who was awarded a contract on March 26, 1906, commenced work with dredge *Washington* September 3, 1906; 794,168 cubic yards have been removed at contract price of 19.9 cents per cubic yard, completing a channel 18½ feet deep, 100 feet wide at bottom, between stations 125+480 and 130+232, a distance of 4,752 feet. A channel has also been dredged 12½ to 16 feet deep between stations 122+647 and 125+480 and between stations 130+232 and 133+109, a total distance of 5,710 feet.

The May flood caused a silting up in this section of about 208,000 cubic yards.

The U. S. dredge *Gen. H. M. Robert* commenced dredging operations at upper end of Harrisburg cut-off January 1, 1907, and excavated 132,500 cubic yards at a cost of 21.55 cents per cubic yard, completing, with the assistance of the U. S. dredge *Col. A. M. Miller*, the cut-off. The dredge was removed from the work May 15, 1907.

The U. S. dredge *Col. A. M. Miller*, during May and June, 1907, excavated from this division 77,440 cubic yards at a cost of 12.11 cents per cubic yard. The dredge was removed from the work June 26, 1907.

*Houston Division (that part of Division 3 between head of Long Reach and Main street, Houston).*—A hydrographic survey was made from head of Long Reach to foot of Main street, Houston, Tex., during March and April, 1907, showing a ruling depth of 4 feet. Field

notes have been plotted and preliminary estimates made for proposed improvement. Proposals were solicited, but as only one bid was received, and that informal and excessive, the work will probably be done by hired labor.

*Money statement.*

July 1, 1906, balance unexpended.....	\$365, 694. 22
Amount appropriated by river and harbor act approved March 2, 1907 .....	200, 000. 00
Proceeds of sales of condemned property.....	. 81
Proceeds of sales of contact prints.....	7. 65
Refundment of overpayment.....	. 74
	<hr/>
	565, 703. 42
June 30, 1907, amount expended during fiscal year, for works of improvement .....	257, 897. 01
	<hr/>
July 1, 1907, balance unexpended.....	307, 806. 41
July 1, 1907, outstanding liabilities.....	52, 311. 82
	<hr/>
July 1, 1907, balance available.....	255, 494. 59
	<hr/>
July 1, 1907, amount covered by uncompleted contracts.....	86, 793. 35
Amount (estimated) required for completion of existing project.....	3, 000, 000. 00
	<hr/>
{ Amount that can be profitably expended in fiscal year ending June 30, 1909, for works of improvement, in addition to the balance unexpended July 1, 1907 .....	400, 000. 00
{ Submitted in compliance with requirements of sundry civil act of June 4, 1897.	

APPROPRIATIONS.

GALVESTON SHIP CHANNEL AND BUFFALO BAYOU.

March 3, 1899.....	\$300, 000. 00
June 13, 1902.....	300, 000. 00
March 3, 1903.....	500, 000. 00
April 28, 1904.....	200, 000. 00
March 3, 1905.....	200, 000. 00
June 30, 1906.....	200, 000. 00
March 2, 1907.....	200, 000. 00
	<hr/>
Total.....	1, 900, 000. 00
In addition to the above appropriations by Congress, the following amounts have been received:	
Receipts from sales of contact prints.....	7. 65
Refundment office of Chief of Engineers.....	40. 11
Refundment of overpayments.....	. 74
Proceeds of sales of condemned property.....	1. 04
	<hr/>
Total.....	1, 900, 049. 54

SHIP CHANNEL IN GALVESTON BAY, TEXAS.

June 10, 1872.....	\$10, 000. 00	August 2, 1882.....	\$94, 500. 00
June 23, 1874.....	10, 000. 00	August 11, 1888.....	100, 000. 00
March 3, 1875.....	35, 200. 00	September 19, 1890.....	132, 316. 85
August 14, 1876.....	72, 000. 00	July 13, 1893.....	40, 000. 00
June 18, 1878.....	75, 000. 00	August 18, 1894.....	50, 000. 00
March 3, 1879.....	80, 000. 00	June 3, 1896.....	50, 000. 00
June 14, 1880.....	50, 000. 00		
March 3, 1881.....	50, 000. 00	Total.....	849, 016. 85

## BUFFALO BAYOU, TEXAS.

March 3, 1881.....	\$25,000.00	July 13, 1892.....	\$25,000.00
August 2, 1882.....	50,000.00	August 18, 1894.....	15,000.00
July 2, 1884.....	25,000.00	June 3, 1896.....	20,000.00
August 5, 1886.....	18,750.00		
August 11, 1888.....	25,000.00	Total.....	228,750.00
September 19, 1890.....	25,000.00		

## CONTRACTS IN FORCE.

Contractor: August Nelson, New York, N. Y.  
 Character of work: Dredging.  
 Rate: 19.9 cents per cubic yard.  
 Date of approval: April 21, 1906.  
 Date of beginning work: May 25, 1906.  
 Date of expiration: December 25, 1907.

## COMMERCIAL STATISTICS FOR THE CALENDAR YEAR 1906.

[Furnished by Direct Navigation Company, L. F. Allien and J. J. Hussey.]

Articles.	Quantity.	Articles.	Quantity.
	<i>Tons.</i>		<i>Tons.</i>
Lumber.....	430	Gravel.....	148
Shell.....	2,016	Bolts and nuts.....	15
Building material.....	4,000	Steel rails.....	257
Wood.....	1,000	Soap.....	96
Rice.....	2,727	Spikes.....	196
Petroleum.....	8,100	Chloride.....	17
Brick.....	250	Bank sand.....	10,535
Cotton (386,358 bales).....	104,317	Linseed oil.....	42
Burlap bags.....	15	Roofing slate.....	120
Coal.....	1,594	Rope.....	711
Stearine.....	18	Cotton bagging.....	82
Packing.....	87		
Roofing paper.....	404	Total.....	132,106
Ale.....	81		

## U 6.

## OPERATING AND CARE OF MORGAN CANAL, TEXAS.

A watchman was stationed at the canal during the year to enforce the regulations governing the navigation of the canal.

*Condition of canal.*—The wooden bulkheads are gradually deteriorating.

For improvement of waterway of which this canal is a part, see page 1461 of this report.

The amount expended during the fiscal year was as follows:

Watchman ..... \$360

## ALLOTMENTS.

December 2, 1896.....	\$240	June 24, 1903.....	\$360
July 16, 1897.....	360	July 8, 1904.....	360
July 1, 1898.....	360	June 23, 1905.....	360
July 1, 1899.....	360	June 16, 1906.....	360
July 14, 1900.....	360	June 14, 1907.....	360
June 11, 1901.....	5,000		
July 18, 1902.....	360	Total.....	8,840

## COMMERCIAL STATISTICS.

*Number of vessels passing up and down through Morgan Canal during calendar year ending December 31, 1906, as reported by the watchman at the canal.*

	Number.
Vessels engaged in carrying freight.....	1,597
Vessels in the employ of the United States or its contractors.....	114
Total.....	1,711

## U 7.

IMPROVEMENT OF WEST GALVESTON BAY CHANNEL, TEXAS, AND THE MOUTHS OF ADJACENT STREAMS, INCLUDING TRINITY RIVER, ANAHUAC CHANNEL, CEDAR BAYOU, CHOCOLATE BAYOU, AND BASTROP BAYOU.

## (A) CHANNEL ACROSS HANNA'S REEF (EAST BAY BAYOU).

## OPERATIONS DURING THE YEAR.

No work performed during the year.

## APPROPRIATION.

June 13, 1902 (allotted).....	\$681. 91
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## (B) DOUBLE BAYOU.

## OPERATIONS DURING THE YEAR.

No work performed during the year.

*Money statement.*

Amount appropriated by river and harbor act approved March 2, 1907..	\$4,000. 00
June 30, 1907, amount expended during fiscal year, for work of improvement .....	. 55
July 1, 1907, balance unexpended.....	3,999. 45

## APPROPRIATIONS.

June 13, 1902 (allotted).....	\$6,952. 65
March 2, 1907 (allotted).....	4,000. 00
	10,952. 65

## (C) ANAHUAC CHANNEL.

## OPERATIONS DURING THE YEAR.

No work has been performed during the year.

*Money statement.*

July 1, 1906, balance unexpended.....	\$263.39
Amount appropriated by river and harbor act approved March 2, 1907.....	6,000.00
	<hr/> 6,263.39
June 30, 1907, amount expended during fiscal year, for works of improvement .....	138.40
July 1, 1907, balance unexpended.....	<hr/> 6,124.99

**APPROPRIATIONS.**

March 3, 1905 (allotted).....	\$6,100.
March 2, 1907 (allotted).....	6,000
Total .....	<hr/> 12,100

**(D) MOUTH OF TRINITY RIVER.****OPERATIONS DURING THE YEAR.**

No work has been performed during the year.

*Money statement.*

July 1, 1906, balance unexpended.....	\$267.07
Amount appropriated by river and harbor act approved March 2, 1907.....	1,000.00
	<hr/> 1,267.07
June 30, 1907, amount expended during fiscal year, for works of improvement .....	70.02
July 1, 1907, balance unexpended.....	<hr/> 1,197.05

**APPROPRIATIONS.**

August 30, 1852 .....	\$3,000.00	June 3, 1896 .....	\$5,000.00
June 18, 1878 .....	10,000.00	June 13, 1902 (allotted)....	62.97
March 3, 1879 .....	2,500.00	March 3, 1905 (allotted)....	3,800.00
June 14, 1880 .....	4,000.00	March 2, 1907 (allotted)....	1,000.00
March 3, 1881 .....	10,000.00		<hr/> 84,862.97
August 2, 1882 .....	8,000.00	Sale of condemned property..	15.18
August 11, 1888 .....	12,500.00		<hr/> 84,878.15
September 19, 1890 .....	10,000.00	Total .....	
July 13, 1892 .....	10,000.00		
August 18, 1894 .....	5,000.00		

**COMMERCIAL STATISTICS.**

During the calendar year 1906 the following produce was taken out through this channel:

Twenty-nine thousand sacks of rice; 50 tons of lumber, valued at \$750,000; 5,000 tons of general merchandise, valued at \$20,000; 10,000 tons of logs, valued at \$80,000; 5 tons of cotton, valued at \$1,000; 4 tons of cotton seed,

valued at \$54; 200 tons of charcoal, valued at \$2,400; 50 hides, valued at \$600; 6,000,000 feet of saw logs, valued at \$60,000; 500 cords of wood, valued at \$2,000; general merchandise, valued at \$25,000; eggs, chickens, and vegetables, valued at \$6,425; 300 head of hogs, valued at \$1,500; and moss and cedar, etc., valued at \$2,000, were taken out of, and 10,000 barrels of fuel oil were sent up, Old River and mouth of Trinity River.

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(E) CEDAR BAYOU.

OPERATIONS DURING THE YEAR.

No work was performed during the year.

*Money statement.*

July 1, 1906, balance unexpended.....	\$179. 02
Amount appropriated by river and harbor act approved March 2, 1907.....	5, 000. 00
	<hr/> 5, 179. 02
June 30, 1907, amount expended during fiscal year, for works of improvement.....	25. 17
	<hr/> 5, 153. 85
July 1, 1907, balance unexpended.....	

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APPROPRIATIONS.

September 19, 1890.....	\$18, 150	March 2, 1907 (allotted).....	\$5, 000
July 13, 1892.....	14, 000		
June 13, 1902.....	5, 000	Total.....	44, 250
March 3, 1905 (allotted).....	2, 100		

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(F) CLEAR CREEK.

OPERATIONS DURING THE YEAR.

No work was performed during the year.

*Money statement.*

Amount appropriated by river and harbor act approved March 2, 1907.....	\$8, 000. 00
June 30, 1907, amount expended during fiscal year, for works of improvement.....	. 80
	<hr/> 7, 999. 70
July 1, 1907, balance unexpended.....	

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APPROPRIATIONS.

June 13, 1902 (allotted).....	\$2. 30
March 2, 1907 (allotted).....	8, 000. 00
	<hr/> 8, 002. 30
Total.....	

## (G) DICKINSON BAYOU.

## OPERATIONS DURING THE YEAR.

No work performed during the year.

*Money statement.*

Amount appropriated by river and harbor act approved March 2, 1907.	\$7,000.00
June 30, 1907, amount expended during fiscal year, for works of improvement.....	.30
July 1, 1907, balance unexpended.....	6,999.70

## APPROPRIATION.

March 2, 1907 (allotted).....	\$7,000
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## (H) BASTROP BAYOU.

## OPERATIONS DURING THE YEAR.

The U. S. dredge *Captain C. W. Howell* commenced dredging in Bastrop Bay April 19, 1907.

A channel has been excavated from 4 to 5 feet deep 40 feet wide for a distance of 14,795 feet. This gives a navigable channel with a ruling depth of 3 feet for a distance of 6 miles measured from the inland waterway at Christmas Point over the bar and up the river.

Two more weeks of excavation will complete the channel to deep water in the bayou.

Sixty-five thousand five hundred and ten cubic yards of material have been removed, at a cost of 9.63 cents per cubic yard.

*Money statement.*

Amount appropriated by river and harbor act approved March 2, 1907.	\$10,000.00
June 30, 1907, amount expended during fiscal year, for works of improvement.....	3,535.14
July 1, 1907, balance unexpended.....	6,464.86
July 1, 1907, outstanding liabilities.....	3,654.19
July 1, 1907, balance available.....	2,810.67

## APPROPRIATION.

March 2, 1907 (allotted).....	\$10,000
-------------------------------	----------

## (I) CHOCOLATE BAYOU.

## OPERATIONS DURING THE YEAR.

No work has been performed during the year.



*Money statement.*

Amount appropriated by river and harbor act approved March 2, 1907.	\$9,000.00
June 30, 1907, amount expended during fiscal year, for works of improvement .....	.55
July 1, 1907, balance unexpended .....	8,999.45

## APPROPRIATION.

March 2, 1907 (allotted) .....	\$9,000
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## (J) CHANNEL IN WEST GALVESTON BAY.

## OPERATIONS DURING THE YEAR.

The U. S. dredge *Gen. S. M. Mansfield* commenced work at mile 27 July 11, 1906. Eight thousand one hundred and eighty feet of channel was dredged from 35 to 40 feet wide and  $3\frac{1}{2}$  feet deep between miles 27 and 1.7.

Twenty-three thousand and one cubic yards of material were removed, at 5.6 cents per cubic yard.

Thirteen single-staff beacons were erected to mark the channel, at a cost of \$79.76.

*Money statement.*

July 1, 1906, balance unexpended .....	\$3,750.57
Proceeds of sales of condemned property .....	58.34
Proceeds of sales of contact prints .....	1.35
	3,810.26
June 30, 1907, amount expended during fiscal year:	
For works of improvement .....	\$2,343.02
For maintenance of improvement .....	1,385.34
	3,728.36
July 1, 1907, balance unexpended .....	81.90
July 1, 1907, outstanding liabilities .....	81.90

## APPROPRIATIONS.

July 13, 1892 .....	\$15,000.00
August 18, 1894 .....	5,000.00
June 3, 1896 .....	5,000.00
March 3, 1905 (allotted) .....	10,000.00
	35,000.00
Sales of condemned property .....	58.34
Sales of contact prints .....	1.35
Total .....	35,059.69

## (K) GALVESTON AND BRAZOS CANAL.

*Maintenance.*—The U. S. dredge *Gen. S. M. Mansfield* dredged 1,720 feet of channel 35 feet wide and 3 feet deep between miles 29.4 and 33.4.

Six thousand four hundred and sixty cubic yards of material were removed, at 14.6 cents per cubic yard.

The U. S. dredge *Captain C. W. Howell* dredged 3,400 feet of channel 35 to 40 feet wide and 3 feet deep between miles 29 and 38.

Thirteen thousand five hundred and fifty-seven cubic yards of material were removed, at 15.5 cents per cubic yard.

*New work.*—The U. S. dredge *Captain C. W. Howell* dredged between miles 28 and 29 a channel 35 to 40 feet wide and 5 feet deep for a distance of 2,085 feet.

Eight thousand four hundred and forty-eight cubic yards of material were removed, at 15.5 cents per cubic yard.

Between miles 33½ and 30.1 the canal banks were reinforced with 971 cubic yards of material dredged for that purpose, at 16.3 cents per cubic yard=\$158.29.

*Recapitulation.*

West Galveston Bay channel, maintenance.....	\$1,385.34
Galveston and Brazos Canal, maintenance.....	3,203.97
Galveston and Brazos Canal, new work.....	1,309.44
Canal banks .....	158.29

A consolidated report of work done by dredges will be found in Appendix 14 of this report.

*Money statement.*

July 1, 1906, balance unexpended.....	\$7,609.56
Refundment of overpayment.....	1.20
	<hr/> 7,610.76
June 30, 1907, amount expended during fiscal year:	
For works of improvement.....	\$4,406.79
For maintenance of improvement.....	3,203.97
	<hr/> 7,610.76

## APPROPRIATIONS.

June 13, 1902 (allotted).....	\$39,307.66
March 3, 1905 (allotted).....	28,000.00
	<hr/> 67,307.66
Refundment of overpayment.....	1.20
	<hr/> 67,308.86
Total.....	

## APPROPRIATIONS.

## DREDGE GEN. H. M. ROBERT.

Act March 3, 1899.....	\$65,000.00
Act June 13, 1902.....	2,992.51
	<hr/> 67,992.51
Sales of condemned property.....	11.79
	<hr/> 68,004.30
Total.....	

## U 8.

## OPERATING AND CARE OF GALVESTON AND BRAZOS CANAL.

A watchman was stationed at canal during the year for operating the drawbridge over the canal and tending log boom at mouth of canal.

The controversy in connection with the drawbridge has been settled. The United States has agreed to build the bridge on the site suggested by the county, and the latter has undertaken to maintain and operate the drawbridge hereafter. Lumber, castings, etc., have been purchased and piles driven for foundation of pivot pier.

For improvement of canal see page 1470 of this report.

Amount expended during fiscal year was as follows:

Watchman.....	\$420. 00
Superintendence and labor.....	131. 94
Tools and supplies.....	43. 59
Hauling material.....	4. 00
<b>Total.....</b>	<b>599. 53</b>

## ALLOTMENTS.

July 19, 1904.....	\$1, 030. 00	June 21, 1907.....	\$420. 00
October 30, 1905.....	759. 23		
June 16, 1906.....	420. 00	<b>Total.....</b>	<b>4, 129. 23</b>
April 23, 1907.....	1, 500. 00		

## COMMERCIAL STATISTICS.

Number of vessels passing up and down through Galveston and Brazos Canal during the calendar year ending December 31, 1906, as reported by the watchman at the canal:

	Number.
Vessels engaged in carrying freight.....	352
Vessels in the employ of the United States or its contractors.....	103
<b>Total.....</b>	<b>455</b>

## U 9.

## IMPROVEMENT OF INLAND WATERWAY ON COAST OF TEXAS.

## (A) WEST GALVESTON BAY AND BRAZOS RIVER CANAL.

## OPERATIONS DURING THE YEAR.

The major part of the work on this channel was paid for out of the appropriation for "West Galveston Bay channel, etc.," see Appendix U 7.

A small amount of maintenance to Brazos River Canal has been done by the U. S. dredge *Captain C. W. Howell* under this appropriation.

*Money statement.*

Amount appropriated by river and harbor act approved March 2, 1907.	\$45,000. 00
June 30, 1907, amount expended during fiscal year, for maintenance of improvement.....	843. 45
July 1, 1907, balance unexpended.....	44,156. 55
Amount (estimated) required for completion of existing project.....	106,528. 00
Amount that can be profitably expended in fiscal year ending June 30, 1908, in addition to the balance unexpended July 1, 1907:	
For works of improvement.....	\$106,528. 00
For maintenance of improvement.....	20,000. 00
	126,528. 00
Submitted in compliance with requirements of sundry civil act of June 4, 1897, and of section 7 of the river and harbor act of 1899.	

## APPROPRIATION.

March 2, 1907..... \$45,000

## COMMERCIAL STATISTICS.

For commercial statistics see page 442 of this report.

## (B) CHANNEL FROM ARANSAS PASS TO PASS CAVALLO.

## OPERATIONS DURING THE YEAR.

No work has been performed.  
Specifications have been approved and the work advertised.

*Money statement.*

Amount appropriated by river and harbor act approved March 2, 1907.	\$40,000. 00
June 30, 1907, amount expended during fiscal year, for works of improvement.....	76. 21
July 1, 1907, balance unexpended.....	39,923. 79
July 1, 1907, outstanding liabilities.....	5. 34
July 1, 1907, balance available.....	39,918. 45
Amount (estimated) required for completion of existing project.....	25,850. 00
Amount that can be profitably expended in fiscal year ending June 30, 1908, in addition to the balance unexpended July 1, 1907:	
For works of improvement.....	\$25,850. 00
For maintenance of improvement.....	15,000. 00
	40,850. 00
Submitted in compliance with requirements of sundry civil act of June 4, 1897, and of section 7 of the river and harbor act of 1899.	

## APPROPRIATION.

March 2, 1907..... \$40,000

## (C) GUADALUPE RIVER TO VICTORIA, TEX.

## OPERATIONS DURING THE YEAR.

No work has been performed.

Specifications have been approved and the work advertised.

*Money statement.*

Amount appropriated by river and harbor act approved March 2, 1907.	\$38, 829. 00
Sales of contact prints.....	. 55
	<hr/>
	38, 829. 55
June 30, 1907, amount expended during fiscal year, for works of improvement.....	38. 76
	<hr/>
July 1, 1907, balance unexpended.....	38, 790. 79
	<hr/>
Amount (estimated) required for completion of existing project....	53, 871. 00
	<hr/>
{ Amount that can be profitably expended in fiscal year ending June 30, 1909, in addition to the balance unexpended July 1, 1907:	
For works of improvement.....	\$53, 871. 00
For maintenance of improvement.....	10, 000. 00
	<hr/>
	63, 871. 00
{ Submitted in compliance with requirements of sundry civil act of June 4, 1897, and of section 7 of the river and harbor act of 1899.	

## APPROPRIATION.

March 2, 1907.....	\$38, 829. 00
Sales of contact prints.....	. 55
	<hr/>
Total.....	38, 829. 55

## (D) TURTLE COVE CHANNEL FROM ARANSAS PASS TO CORPUS CHRISTI.

## OPERATIONS DURING THE YEAR.

No work has been performed.

Specifications have been approved, but advertisement has been deferred until land questions can be settled.

*Money statement.*

Amount appropriated by river and harbor act approved March 2, 1907.	\$10, 000. 00
June 30, 1907, amount expended during fiscal year, for works of improvement.....	41. 71
	<hr/>
July 1, 1907, balance unexpended.....	9, 958. 29
	<hr/>
Amount (estimated) required for completion of existing project....	113, 750. 00
	<hr/>
{ Amount that can be profitably expended in fiscal year ending June 30, 1909, in addition to the balance unexpended July 1, 1907:	
For works of improvement.....	\$113, 750. 00
For maintenance of improvement.....	15, 000. 00
	<hr/>
	128, 750. 00
{ Submitted in compliance with requirements of sundry civil act of June 4, 1897, and of section 7 of the river and harbor act of 1899.	

## APPROPRIATION.

March 2, 1907.....	\$10, 000. 00
--------------------	---------------

## U 10.

## IMPROVEMENT OF THE MOUTH OF BRAZOS RIVER, TEXAS.

## OPERATIONS DURING THE YEAR.

Operations were continued during the year under contract with Charles Clarke & Co., of Galveston, Tex., and completed August 20, 1906.

Three thousand eight hundred and eighty-seven and three-hundredths tons of small riprap were delivered and placed, at \$3.12 per ton, amounting to \$12,127.53.

Seven thousand one hundred and ninety-one and forty-two hundredths tons of large riprap, at \$3.73 per ton, amounting to \$26,823.99, between stations 10 and 47, northeast jetty, and station 38+85 and station 50, southwest jetty.

Repairs were made to spur dikes in Big Bend above the light-house to an amount of \$4,495.49.

Crib dikes on north bank between the jetty and entrance to Brazos Canal were repaired, at a cost of \$7,877.55.

## SURVEYS.

A map <sup>a</sup> of the latest survey is submitted herewith.

*Money statement.*

July 1, 1906, balance unexpended.....	\$114, 566. 31
Amount appropriated by river and harbor act approved March 2, 1907.....	35, 000. 00
	<hr/> 149, 566. 31
June 30, 1907, amount expended during fiscal year, for works of improvement.....	89, 282. 78
	<hr/> 60, 282. 53
July 1, 1907, balance unexpended.....	60, 282. 53
July 1, 1907, outstanding liabilities.....	95. 58
	<hr/> 60, 187. 95
July 1, 1907, balance available.....	60, 187. 95
Amount (estimated) required for completion of existing project.....	102, 500. 00
	<hr/> <hr/>
Amount that can be profitably expended in fiscal year ending June 30, 1909, for works of improvement, in addition to the balance unexpended July 1, 1907.....	102, 500. 00
Submitted in compliance with requirements of sundry civil act of June 4, 1897, and of section 7 of the river and harbor act of 1899.	

## APPROPRIATIONS.

June 14, 1880.....	\$40, 000. 00
March 3, 1881.....	40, 000. 00
August 2, 1882.....	50, 000. 00
July 5, 1884.....	10, 000. 00
August 5, 1886.....	18, 750. 00
March 3, 1899.....	85, 000. 00
June 13, 1902.....	50, 000. 00
March 3, 1905.....	50, 000. 00
June 30, 1906.....	87, 500. 00
March 2, 1907.....	35, 000. 00
	<hr/> 466, 250. 00

In addition to the above appropriations by Congress, the following amount has been received: Proceeds of sales of condemned property

-----	\$8. 66
Total -----	466, 258. 66

## CONTRACTS IN FORCE.

Contractor: Charles Clarke & Co., Galveston, Tex.

Character of work: Repairing jetties.

Rate: Small riprap properly placed on the work, \$3.12 per ton. Large riprap properly placed on the work, \$3.73 per ton.

Date of approval: September 25, 1905.

Date of beginning of work: January 1, 1906.

Date of expiration: July 11, 1906. Contract completed August 20, 1906.

## U II.

## IMPROVEMENT OF ARANSAS PASS AND BAY, TEXAS.

## OPERATIONS DURING THE FISCAL YEAR.

A rock lump with 16.5 feet of water on it, supposed to be the remains of the old Government jetty, was removed to a depth of more than 25 feet.

Specifications have been approved for the construction of a south jetty, but advertisement of same has been deferred until land questions can be settled.

## SURVEYS.

A map<sup>a</sup> of latest survey is submitted herewith.

*Money statement.*

July 1, 1906, balance unexpended -----	\$114, 307. 11
Amount appropriated by river and harbor act approved March 2, 1907 -----	200,000. 00
Proceeds of sales of contact prints -----	1. 65
	<hr/>
June 30, 1907, amount expended during fiscal year, for works of improvement -----	314, 308. 76
	110, 983. 55
July 1, 1907, balance unexpended -----	203, 325. 21
July 1, 1907, outstanding liabilities -----	245. 99
	<hr/>
July 1, 1907, balance available -----	203, 079. 22
	<hr/>
Amount (estimated) required for completion of existing project ..	1, 088, 699. 50
	<hr/>
Amount that can be profitably expended in fiscal year ending June 30, 1909, in addition to the balance unexpended July 1, 1907:	
For works of improvement -----	\$290, 000. 00
For maintenance of improvement -----	50, 000. 00
	<hr/>
Submitted in compliance with requirements of sundry civil act of June 4, 1897, and of section 7 of the river and harbor act of 1890.	340, 000. 00

# 1476 REPORT OF THE CHIEF OF ENGINEERS, U. S. ARMY.

## APPROPRIATIONS.

March 3, 1879	-----	\$35,000.00
June 14, 1880	-----	65,000.00
March 3, 1881	-----	80,000.00
August 2, 1882	-----	100,000.00
July 5, 1884	-----	100,000.00
August 5, 1886	-----	101,250.00
August 11, 1888	-----	100,000.00
March 3, 1899	-----	60,000.00
June 13, 1902	-----	250,000.00
March 3, 1905	-----	100,000.00
June 30, 1906	-----	100,000.00
March 3, 1907	-----	200,000.00

1,291,250.00

In addition to the above appropriations by Congress, the following amount has been received: Receipts from sales of contact prints. 1.65

Total ----- 1,291,251.65

## U 12.

### IMPROVEMENT OF HARBOR AT BRAZOS SANTIAGO, TEXAS.

#### OPERATIONS DURING THE YEAR.

No work was done during the year.

The amount expended was for payment of inspection and miscellaneous work.

#### Money statement.

July 1, 1906, balance unexpended	-----	\$5,672.70
June 30, 1907, amount expended during fiscal year, for works of improvement	-----	86.51

July 1, 1907, balance unexpended ----- 5,586.19

{ Amount that can be profitably expended in fiscal year ending June 30, 1909, for works of improvement, in addition to the balance unexpended July 1, 1907 ----- 50,000.00  
Submitted in compliance with requirements of sundry civil act of June 4, 1897.

## APPROPRIATIONS.

June 14, 1880	-----	\$25,000	August 5, 1886	-----	\$37,500
March 3, 1881	-----	75,000	August 11, 1888	-----	25,000
August 2, 1882	-----	60,000			
July 5, 1884	-----	25,000	Total	-----	247,500

## U 13.

### CONSTRUCTION OF SEA WALL, EMBANKMENT, AND FILL ALONG THE FRONT OF THE FORT CROCKETT RESERVATION, GALVESTON, TEXAS, AND CONSTRUCTING SEA WALL FROM THIRTY-NINTH STREET TO THE WEST LINE OF FORTY-FIFTH STREET IN THE CITY OF GALVESTON.

#### OPERATIONS DURING THE YEAR.

The work of filling, soiling, and sodding Fort Crockett Reservation and behind the sea wall between Thirty-ninth and Forty-fifth streets



was carried on under contract entered into with the North American Dredging Company March 20, 1906, and approved May 7, 1906.

During the year 995,691 cubic yards of sand filling have been deposited and properly placed at a cost of 22.99 cents per cubic yard, amounting to \$228,909.36.

Actual pumping began October 18, 1906.

The plant consists of one 20-inch cutter dredge, one steam booster plant, and one electrically-driven relay, with a total length of pipe line of over 8,000 feet.

Before this contract is completed the contractor will have extended his pipe line to 12,000 feet.

#### *Money statement.*

July 1, 1906, balance unexpended.....	\$426, 638. 53
Refundment on overpayment.....	. 09
	<hr/>
	426, 638. 62
June 30, 1907, amount expended during fiscal year, for works of improvement.....	143, 282. 63
	<hr/>
July 1, 1907, balance unexpended.....	283, 355. 99
July 1, 1907, outstanding liabilities.....	42, 497. 60
	<hr/>
July 1, 1907, balance available.....	240, 858. 39
	<hr/>
July 1, 1907, amount covered by uncompleted contracts.....	169, 426. 67

#### APPROPRIATIONS.

April 28, 1904.....	\$591, 046. 25
June 30, 1906.....	158, 953. 75
	<hr/>
Total.....	750, 000. 00
In addition to the above appropriations by Congress, the following additional amount has been received:	
Refundment of overpayment.....	. 09
	<hr/>
Total.....	750, 000. 09

#### CONTRACTS IN FORCE.

Contractor: North American Dredging Company, San Francisco, Cal.

Character of work: Filling, soiling, and sodding.

Rate: Fill, soil, and sod in place, 22.99 cents per cubic yard.

Date of approval: May 7, 1906.

Date of beginning work: July 25, 1906.

Date of expiration: Filling Fort Crockett Reservation, July 25, 1907; filling Fort Crockett Reservation and behind sea wall between Thirty-ninth and Forty-fifth streets, October 25, 1907.

#### U 14.

#### OPERATION OF DREDGES.

##### (A)

##### DREDGING.

[By U. S. dredge Gen. C. B. Comstock, G. M. Prendergast, master.]

The dredge excavated, removed, and dumped from Galveston Harbor, cubic yards of material as per following:

*Detailed statement.*

Location and character of material.	Amount dredged.		Cubic yards.		
	Number of loads.	Cubic yards.	Rate per minute pumping.	Rate per hour pumping.	Total time pumping fiscal year.
Outer bar: Sand, clay, and shell .....	387	220,974	7.48	449	Hrs. min. 492 01
Inner bar: Sand and silt .....	1,602	883,433	7.22	433	2,038 07
Total .....	1,989	1,104,407	7.28	437	2,530 08

	Cents
Cost per cubic yard for operating only .....	4.28
Total cost per cubic yard for operating, repairs, etc .....	7.00

*Distribution of effective working time.*

	Hrs.	min.
Pumping .....	2,530	08
Dumping .....	189	47
Going to and from dump .....	656	44
Going to and from wharf or from anchorage to cut .....	72	30
Total effective working time .....	3,449	09

*Distribution of time lost while in commission.*

	Hrs.	min.
Taking fuel and water .....	71	07
Bad weather .....	237	10
Washing boilers and ordinary repairs .....	241	37
Extraordinary repairs .....	56	30
Sundays and holidays .....	936	00
Other causes .....	412	27
Total time lost while in commission .....	2,004	51

*Distribution of time lost while out of commission.*

	Hrs.	min.
Extraordinary repairs .....	1,332	0
Other causes .....	498	0
Total time lost while out of commission .....	1,830	0
Total time accounted for .....	7,284	0

*Money expended.*

Wages .....	\$19,230.29
Fuel for boiler (oil) .....	17,611.57
Fuel for gallery .....	250.00
Water .....	285.22
Supplies, subsistence .....	4,647.39
Supplies, engine room .....	1,115.54
Other supplies .....	1,962.66
Ordinary repairs .....	1,198.27
Laundry, ice, miscellaneous expense, etc. ....	734.64
Tender .....	262.33
Extraordinary repairs and alterations and additions to dredge .....	29,956.03
Total expended .....	77,253.94

## (B)

## DETAILED STATEMENT OF OPERATIONS OF U. S. DREDGE "GEN. C. B. COM-STOCK" FROM SEPTEMBER 26, 1895, TO JUNE 30, 1907.

*Cost.*

Contract price of dredge.....	\$86,000.00
Fittings, suction pipe, drags, etc.....	8,629.84
Outfit.....	1,534.55
Improvement to plant.....	28,692.29
Improvement to hull.....	20,999.51
	<hr/>
	145,856.19

*Operation expense and repairs.*

Ordinary repairs.....	\$65,037.67
Extraordinary repairs.....	104,774.16
Pay rolls.....	189,775.30
Fuel.....	84,151.06
Engine-room supplies.....	13,606.32
Subsistence.....	49,850.61
Miscellaneous.....	18,231.38
	<hr/>
	525,426.50

Grand total to June 30, 1907..... 671,282.69

*Table of material dredged for each year.*

Year.	Loads.	Cubic yards.					Total.
		Outer bar.	Inner bar.	Channel.	Reserva- tion.	Pensaco- la, Fla.	
1896.....	774	201,243	218,505	.....	.....	.....	419,748
1897.....	1,464	255,675	529,190	21,781	.....	.....	806,646
1898.....	1,014	146,462	363,112	53,402	.....	.....	562,976
1899.....	899	157,587	76,236	266,879	.....	.....	500,702
1900.....	301	125,387	28,392	11,047	496,262	184,753	845,791
1901.....	807	121,372	314,824	6,626	.....	.....	442,822
1902.....	336	53,968	25,391	102,106	.....	.....	181,485
1903.....	1,118	232,818	158,641	226,608	.....	.....	613,067
1904.....	1,228	320,392	354,105	.....	.....	.....	674,497
1905.....	1,999	512,713	578,927	.....	.....	.....	1,091,640
1906.....	2,394	507,610	796,255	.....	.....	.....	1,303,865
1907.....	1,989	220,974	883,433	.....	.....	.....	1,104,407
Total.....	14,823	2,856,171	4,322,011	688,449	496,262	184,753	8,547,646

*Cost per cubic yard dredging, including original cost of dredge and all expenses to June 30, 1907.*

	Operating cost.	Total cost.
	<i>Cents.</i>	<i>Cents.</i>
Channel, bar, and reservation.....	4.69	6.89
Pensacola, Fla.....	.....	6.06

Table of cost of dredging.

Fiscal year.	Operating cost.	Total cost.	Per cubic yard.	
			Operating cost.	Total cost.
			<i>Cents.</i>	<i>Cents.</i>
1896.....	\$26,947.82	\$31,061.35	6.42	7.40
1897.....	43,218.81	58,143.02	5.35	7.21
1898.....	27,929.33	44,107.51	4.96	7.80
1899.....	31,129.86	44,712.08	6.22	8.90
1900.....	29,346.22	33,307.09	4.43	5.03
1901 <sup>a</sup> .....	33,098.44	60,866.97	7.47	13.65
1902 <sup>b</sup> .....	14,376.18	44,508.09	7.9	24.5
1903.....	31,367.86	34,622.76	5.1	5.6
1904.....	26,974.65	39,894.67	4.0	5.9
1905.....	37,561.25	61,663.76	3.4	4.7
1906.....	43,114.36	57,111.61	3.3	4.4
1907 <sup>c</sup> .....	47,297.01	77,253.94	4.28	7.0
Total.....	392,356.77	576,652.85	.....	.....

<sup>a</sup> Includes \$21,000 cost of floating dredge which stranded on Pelican Flat during the hurricane on September 8, 1900.

<sup>b</sup> Extraordinary repairs occasioned by severe hurricane of September 8, 1900, \$27,081.93 expended.

<sup>c</sup> Extraordinary repairs occasioned by continual service since 1902.

From 1896 to 1905, inclusive, 10 per cent of cost of dredge was included each year in obtaining the figures in the last column.

No allowance since 1905 for depreciation has been made.

## (C)

## OPERATIONS OF U. S. DREDGE "COL. A. M. MILLER" FROM JULY 1, 1906, TO JUNE 30, 1907.

Total number of cubic yards excavated.....	1, 176, 748. 00
Number of cubic yards dredged per hour.....	299. 12
Number of cubic yards dredged per minute.....	4. 99

NOTE.—Rehandled material not allowed in above.

*Distribution of working time.*

	Hrs.	min.
Pumping.....	3, 934	25
Handling pipe line.....	513	50
Handling swinging wires.....	263	40
Total.....	4, 711	55

*Distribution of time.*

	Hrs.	min.
Effective working time.....	4, 711	55
Delays changing location of dredge.....	328	0
Delays taking fuel and water.....	4	10
Delays for bad weather.....	18	30
Delays washing boilers and ordinary repairs.....	1, 242	55
Delays for extraordinary repairs.....	502	30
Delays for other causes.....	524	0
Sundays and holidays.....	1, 428	0
Total time to be accounted for.....	8, 760	0

*Cost of dredging at each improvement.*

Improvement.	Cubic yards removed.	Operating cost.	Operating cost per yard.
			<i>Cents.</i>
Galveston channel (new work) .....	584, 727	\$22, 291. 57	4. 17
Galveston channel (maintenance) .....	404, 981	15, 839. 71	3. 91
Galveston ship channel and Buffalo Bayou—division 2 (new work) .....	119, 600	23, 979. 80	25. 0
Galveston ship channel and Buffalo Bayou—division 2 (maintenance) .....	40, 000	3, 629. 70	9. 07
Galveston ship channel and Buffalo Bayou—division 3 (new work) .....	77, 440	9, 376. 01	12. 11
Total .....	1, 176, 748	81, 116. 79	6. 89

Sixty-one thousand seven hundred and sixty cubic yards of rehandled material was excavated by dredge which is not allowed in above yardages.

For explanation of high cost of dredging in Galveston ship channel and Buffalo Bayou, division 2, see Appendix 5.

*Running expenses.*

Pay rolls .....	\$27, 942. 04
Fuel for boilers .....	22, 680. 89
Fuel for galley .....	278. 95
Water .....	243. 08
Supplies, subsistence .....	7, 620. 31
Supplies, engine room .....	2, 113. 60
Other supplies .....	5, 865. 51
Renewals of or addition to outfit .....	512. 09
Ordinary repairs .....	3, 176. 91
Laundry, miscellaneous expenses, etc. ....	1, 264. 07
Tender .....	6, 162. 74
Dike and levee .....	3, 256. 60
Operating cost .....	81, 116. 79
Extraordinary repairs .....	3, 610. 77
Alterations and additions .....	5, 426. 01

Total cost of dredging..... 90, 153. 57

## (D)

*Operations of U. S. dredge "Gen. H. M. Robert," from July 1, 1906, to June 30, 1907.*

Total number of cubic yards excavated.....	508, 010. 00
Number of cubic yards dredged per hour.....	94. 38
Number of cubic yards dredged per minute.....	1. 57

NOTE.—Rehandled material not allowed in above.

*Distribution of working time.*

	Hrs.	Min.
Pumping .....	5, 382	36
Handling pipe line .....	342	39
Handling swinging wires .....	67	25
Total .....	5, 792	40

*Distribution of time.*

	Hrs.	Min.
Effective working time .....	5, 792	40
Delays changing location of dredge .....	85	15
Delays for bad weather .....	35	10
Delays washing boilers and ordinary repairs .....	536	20
Delays for extraordinary repairs .....	56	20
Delays for other causes .....	622	15
Sundays and holidays .....	1, 404	00

Total time to be accounted for..... 8, 532 00

*Running expenses.*

Pay rolls.....	\$29,489.48
Fuel for boilers.....	19,245.04
Fuel for galley.....	311.20
Water.....	41.55
Supplies, subsistence.....	7,921.97
Supplies, engine room.....	2,179.42
Other supplies.....	1,773.91
Renewals of or addition to outfit.....	2,153.90
Ordinary repairs.....	856.11
Laundry, ice, miscellaneous expenses, etc.....	957.31
Tender.....	4,275.76
Levee and dike.....	3,238.70
Operating cost.....	70,444.35
Extraordinary repairs.....	438.35
Alterations and additions.....	2,650.63
Total cost of dredging.....	73,533.33

*Cost of dredging at each improvement.*

Improvement.	Cubic yards removed.	Operating cost.	Operating cost per yard.
Galveston ship channel and Buffalo Bayou (new work) Division 2.	176,900	\$31,199.17	<i>Cents.</i> 17.64
Galveston ship channel and Buffalo Bayou (new work) Division 3.	132,500	28,551.87	21.55
Galveston channel.....	198,610	10,698.81	5.38
Total.....	508,010	70,444.35	13.87

Forty-nine thousand five hundred and eighty cubic yards of rehandled material excavated by dredge in Buffalo Bayou is not allowed in above yardages.

## (E)

*Operations of the U. S. dredge "Captain C. W. Howell," from July 1, 1906, to June 30, 1907.*

Place.	Date.	Number of yards.	Cost per yard.	Remarks.
Galveston and Brazos Canal...	July 1 to 31, 1906.....	10,285	<i>Cents.</i> 15.5	
	Aug. 1, 1906.....			
	Aug. 27, 1906.....			Repairs.
Brazos River, Velasco, mile 91.	Aug. 29 to Oct. 20.....			Snagging.
Brazos River, mile 88.....	Oct. 21 to Dec. 18.....			Laid up on account of low water.
Brazos River (mouth).....	Dec. 19 to Feb. 19.....			Repairs to crib dikes.
Brazos River.....	Feb. 20 to Mar. 25.....			Snagging.
Galveston and Brazos Canal...	Mar. 26 to Apr. 18.....	16,518	15.5	
Bastrop Bayou.....	Apr. 19 to June 30.....	80,156	9.71	

NOTE.—Cost of movements of *Howell* are included in yardage cost.

## (F)

*Operations of the U. S. dredge "Gen. S. M. Mansfield," from July 1, 1906, to August 31, 1906.*

Place.	Date.	Number of yards.	Cost per yard.
Galveston and Brazos Canal.....	July 1 to 10, 1906.....	6,460	<i>Cents.</i> 14.6
West Galveston Bay.....	July 11 to Aug. 31, 1906...	23,001	5.6

August 31, 1906, crew and property transferred to dredge *Captain C. W. Howell*, and boat proceeded to Galveston for transfer to Trinity River.

## APPENDIX V.

IMPROVEMENT OF BRAZOS RIVER FROM VELASCO TO WACO AND TRINITY RIVER, TEXAS, OF CYPRESS BAYOU, LOUISIANA AND TEXAS, OF RED RIVER ABOVE FULTON, ARKANSAS, AND OF SULPHUR RIVER, ARKANSAS AND TEXAS.

REPORT OF CAPT. W. P. WOOTEN, CORPS OF ENGINEERS, OFFICER IN CHARGE, FOR THE FISCAL YEAR ENDING JUNE 30, 1907.

### IMPROVEMENTS.

- |  |   |
|--|---|
| 1. Brazos River from Old Washington to Waco, Texas.    | 4. Cypress Bayou, Louisiana and Texas.          |
| 2. Brazos River from Velasco to Old Washington, Texas. | 5. Red River, above Fulton, Arkansas and Texas. |
| 3. Trinity River, Texas.                               | 6. Sulphur River, Texas and Arkansas.           |

UNITED STATES ENGINEER OFFICE,  
*Dallas, Tex., July 6, 1907.*

GENERAL: I have the honor to forward herewith annual reports for the fiscal year ending June 30, 1907, upon the works of river improvement in the Dallas, Tex., district.

Very respectfully, your obedient servant,

W. P. WOOTEN,  
*Captain, Corps of Engineers.*

Brig. Gen. A. MACKENZIE,  
*Chief of Engineers, U. S. A.*

### V 1.

IMPROVEMENT OF BRAZOS RIVER, TEXAS, BETWEEN OLD WASHINGTON AND WACO.

[This work was in the charge of Maj. Edgar Jadwin, Corps of Engineers, to April 9, 1907.]

Practically all work during the year has been done on the land wall and quarters and plant at Lock and Dam No. 1 at Hidalgo Falls.

The excavation for the wall has been made, the foundation piles driven, and about 90 per cent of the concrete has been placed. The backfilling behind the wall has been partially completed and the upper guide crib has been completed, except for the paving. The con-

struction of the lock tender's dwelling, at a cost of \$3,038.37, was completed, but the building was completely destroyed by fire April 25, 1907.

Of the principal items of work, the quantities and cost were as follows:

Kind.	Quantity.	Cost.
Excavation .....	cubic yards.. 22,261	\$9,568.24
Round piles.....	334	7,999.83
Sheet piles.....	811	7,652.57
Concrete .....	cubic yards.. 2,333.4	25,582.86

#### ESTIMATE.

The amount expended during the year was \$67,004.39. The available balance July 1, 1907, was \$51,460.59. It is proposed to expend the available balance in continuing the construction of Lock and Dam No. 1. In addition the following appropriations and authorizations are recommended:

The appropriation of \$150,000, already authorized for completing Lock and Dam No. 1.

The appropriation of \$150,000, accompanied by authority to enter into continuing contracts for the expenditure of \$450,000 additional, for the construction of Locks and Dams Nos. 2 and 3.

#### Money statement.

July 1, 1906, balance unexpended.....	\$54,253.53
Amount appropriated by river and harbor act approved March 2, 1907..	75,000.00
Amount refunded account disallowance on voucher.....	2.17
	<hr/> 129,255.70
June 30, 1907, amount expended during fiscal year, for works of improvement.....	67,004.39
July 1, 1907, balance unexpended.....	62,251.31
July 1, 1907, outstanding liabilities.....	10,790.72
July 1, 1907, balance available.....	<hr/> 51,460.59
Amount (estimated) required for completion of existing project.....	<hr/> 150,000.00
<hr/>	
{ Amount that can be profitably expended in fiscal year ending June 30, 1909, for works of improvement, in addition to the balance unexpended July 1, 1907.....	
Submitted in compliance with requirements of sundry civil act of June 4, 1897.	
	300,000.00

#### APPROPRIATIONS.

March 3, 1905.....	\$75,000
March 2, 1907.....	75,000
Total.....	<hr/> 150,000

#### COMMERCIAL STATISTICS.

Owing to the fact that the improvement is just beginning, no commerce of account has yet developed.



## V 2.

## IMPROVEMENT OF BRAZOS RIVER, TEXAS, BETWEEN VELASCO AND OLD WASHINGTON.

[This work was in the charge of Maj. Edgar Jadwin, Corps of Engineers, to April 9, 1907.]

During the year 450 linear feet of rock jetty was partially completed, 418 snags, 3 stumps, and 12 trees were removed from the river, and 15 leaning trees were cut. A new hull has been placed on the snag boat *Navasota*, and the plant has been generally repaired. Three drifts have been removed from near the St. Louis, Brownsville and Mexico Railway. The parts of the projects remaining unfinished are the snagging and the improvement of two shoals between Richmond and Hempstead.

## ESTIMATE.

An appropriation of \$40,000 is recommended for maintaining the improvement.

*Money statement.*

July 1, 1906, balance unexpended.....	\$8,435.92
Amount appropriated by river and harbor act approved March 2, 1907.....	75,000.00
Amount received account of sales of condemned property and refundment.....	66.42
	<hr/> 83,502.34
June 30, 1907, amount expended during fiscal year, for works of improvement.....	11,047.82
July 1, 1907, balance unexpended.....	72,454.52
July 1, 1907, outstanding liabilities.....	1,143.25
July 1, 1907, balance available.....	<hr/> 71,311.27
<hr/>	
{ Amount that can be profitably expended in fiscal year ending June 30, 1909, for maintenance of improvement, in addition to the balance unexpended July 1, 1907.....	40,000.00
{ Submitted in compliance with requirements of sundry civil act of June 4, 1897, and of section 7 of the river and harbor act of 1890.	

## APPROPRIATIONS.

June 3, 1896.....	\$5,000
June 13, 1902.....	150,000
March 3, 1905.....	25,000
March 2, 1907.....	75,000
Total.....	<hr/> 255,000

## COMMERCIAL STATISTICS.

No commercial statistics were obtainable for the river above Velasco.

## V 3.

## IMPROVEMENT OF TRINITY RIVER, TEXAS.

## LOCK AND DAM NO. 1.

During the year the cofferdam was constructed around the locksite, the excavation for the land wall was made, the piles for the foundation of lock floor and walls were driven, 85 per cent of the concrete in land wall and 50 per cent of that in the river wall was placed, and the lock tender's dwelling was completed.

## LOCKS AND DAMS NOS. 2 AND 4.

Plans and specifications for locks and dams Nos. 2 and 4 have been submitted to the Department and approved.

## LOCK AND DAM NO. 6.

A contract for the construction of this lock and dam was made with the Hubbard Building and Realty Company July 10, 1906. The excavation for land wall has been partially completed, part of the land has been grubbed and cleared, piles for the cofferdam have been driven, and a lock tender's dwelling has been constructed.

The snag boats *Mansfield* and *Wolff* and the launch *Holland* have been engaged in removing obstructions from the river. About 145 miles of the river have been gone over, the following work having been done:

Snags destroyed.....	8,990	Leaning trees cut.....	2,550
Stumps destroyed.....	4,861	Shore snags cut.....	6,575
Logs removed.....	3,087	Trees cut from caving banks.....	2,206
Jams destroyed.....	65		

## ESTIMATES.

The amounts expended during the year and the unexpended balances July 1, 1907, were as follows:

	Expended during year.	Balance unexpended July 1, 1907.
Constructing locks and dams Nos. 1, 2, and 6 .....	\$58,119.98	\$344,721.23
Constructing lock and dam No. 4 and lock and dam at Hurricane Shoals.....	492.48	39,507.32
Funds contributed by citizens of Dallas. ....	7,076.47	67,646.08
Improvement below section 1 .....	14,949.58	10,050.42
Maintenance.....		35,000.00
Total.....	80,638.51	486,925.25

The unexpended balances will be applied as follows: "Constructing Locks and Dams 1, 2, and 6," to continuing the construction of those locks and dams.

"Constructing Locks and Dams No. 4 and at Hurricane Shoals," to beginning the construction of those locks and dams.

"Funds contributed by citizens of Dallas," to the construction of the dam at Parsons Slough and to the improvement of section 1.

"Improvement below section 1," to the removal of obstructions, etc.

“Maintenance,” to removing obstructions and keeping the river clear of snags, drift, etc.

In addition the following appropriations and authorizations are recommended:

The appropriation of \$150,000 of the \$300,000 already authorized for continuing the construction of Lock and Dam No. 4 and the lock and dam at Hurricane Shoals.

The appropriation of \$150,000 accompanied by authority to enter into continuing contracts for the expenditure of \$450,000 additional for the construction of Lock and Dam No. 7, a lock and dam at White Rock Shoals, and a lock and dam near mile 360.

The appropriation of \$35,000 for operating snag boats and continuing the removal of obstructions, etc.

### *Money statement.*

July 1, 1906, balance unexpended-----	\$417, 276. 76
Amount appropriated by sundry civil act approved March 4, 1907----	75, 287. 00
Amount appropriated by river and harbor act approved March 2, 1907--	75, 000. 00
	<hr/>
June 30, 1907, amount expended during fiscal year, for works of improvement -----	567, 563. 76
	<hr/>
July 1, 1907, balance unexpended-----	80, 638. 51
July 1, 1907, outstanding liabilities-----	<hr/>
	486, 925. 25
July 1, 1907, outstanding liabilities-----	2, 589. 51
	<hr/>
July 1, 1907, balance available-----	484, 335. 74
	<hr/>
July 1, 1907, amount covered by uncompleted contracts-----	240, 664. 65
	<hr/>
{ Amount that can be profitably expended in fiscal year ending June 30, 1909, for works of improvement, in addition to the balance unexpended July 1, 1907-----	335, 000. 00
{ Submitted in compliance with requirements of sundry civil act of June 4, 1897.	

### APPROPRIATIONS.

March 3, 1899-----	\$7, 000. 00
June 13, 1902-----	125, 000. 00
March 3, 1903-----	250, 000. 00
June 30, 1906-----	111, 000. 00
March 2, 1907-----	75, 000. 00
March 4, 1907-----	75, 287. 00
	<hr/>
Total appropriations-----	643, 287. 00
Received from citizens of Dallas, Tex-----	66, 000. 00
Received from sales of condemned property-----	31. 27
	<hr/>
Total-----	709, 318. 27

### CONTRACTS IN FORCE.

#### 1.

Name of contractor: D. C. McCord.

Character of work: Construction of Lock and Dam No. 1 and dam at Parsons Slough.

Amount: \$135,792.18.

*Unit prices.*

Classification.	Lock and Dam No. 1.	Dam at Parsons Slough.
Grubbing and clearing .....	acres..	\$15.30
Excavation .....	cubic yards..	86
Round timber .....	linear feet..	.06
Round piles .....	do..	.19
Brush .....	cords..	2.40
Concrete in lock walls .....	cubic yards..	7.10
Other concrete .....	do..	7.10
Boule gates .....	feet B. M..	72.00
Oak timber .....	do..	12
Timber in permanent work .....	do..	84.00
Timber in cribs .....	do..	54.00
Riprap .....	cubic yards..	4.92
Iron and steel .....	pounds..	.11
Steel reinforcing rods .....	do..	.07
Chain .....	do..	.13
Drift bolts .....	do..	.09
Sheet piling .....	feet B. M..	60.00
Sheet piling, steel .....	linear feet..	8.00
Plain filling .....	cubic yards..	.18
Compacted filling .....	do..	.48
Riprap paving .....	square feet..	.18
Paving on spalls .....	do..	.21
Paving in concrete .....	do..	.32
Paving for cribs .....	do..	.36
Sand bags .....	each..	.12
Gauges .....	linear feet..	3.00
Crab, crane, and service car .....	pounds..	.23
Frames with rollers .....	each..	10.80
Drains under lock floor .....	linear feet..	.60
Concrete .....	cubic yards..	8.00
Surface soil .....	do..	1.00
Crab .....	pounds..	.20

Date of approval: March 26, 1906.

Date of beginning: March 31, 1906.

Date of expiration: December 1, 1907.

2.

Name of contractor: Hubbard Building and Realty Company.

Character of work: Construction of Lock and Dam No. 6.

Amount: \$144,113.95.

*Unit prices.*

Classification.	Dam at Parsons Slough.
Grubbing and clearing .....	acres..
Excavation .....	cubic yards..
Round timber .....	linear feet..
Round piles .....	do..
Brush .....	cords..
Concrete .....	cubic yards..
Boule gates .....	feet B. M..
Oak timber .....	do..
Timber in permanent work .....	do..
Timber in cribs .....	do..
Riprap .....	cubic yards..
Iron and steel .....	pounds..
Steel reinforcing rods .....	do..
Chain .....	do..
Drift bolts .....	do..
Sheet piling .....	feet B. M..
Sheet piling, steel .....	linear feet..
Plain filling .....	cubic yards..
Compacted filling .....	do..
Riprap paving .....	square feet..
Paving on spalls .....	do..
Paving in concrete .....	do..
Paving for cribs .....	do..
Sand bags .....	each..
Gauges .....	linear feet..
Crab, crane, and service car .....	pounds..
Frames with rollers .....	each..
Drains under lock floor .....	linear feet..

Date of approval: July 28, 1906.

Date of beginning: October 10, 1906.

Date of expiration: September 1, 1908.

## COMMERCIAL STATISTICS.

Only very incomplete statistics have been obtainable. The only commercial boat reported is the steamer Horatio, of 46 tons, 4½-foot draft, with barges 4-foot draft, which has made 20 trips between Galveston and Blairs Mill Landing, carrying 1,000 tons of lumber, 1,500 tons of machinery, 250 tons of grain, and 500 tons of piles. Saw logs to the amount of 1,400,000 feet B. M. are reported as having been rafted out.

## V 4.

## IMPROVEMENT OF CYPRESS BAYOU, TEXAS AND LOUISIANA.

In September a quarter boat was put at work cleaning the channel between Jefferson and Mooringsport, a distance of 37½ miles. Work was continued from September until May, when the boat was laid up on account of high water. The work done was as follows:

Snags destroyed.....	54	Logs removed.....	15
Stumps destroyed.....	1,457	Leaning trees cut.....	5,853
Shore snags cut.....	75	Square yards of brush cut.....	26,360

One wreck of a bridge and one wreck of a barge were removed.

*Money statement.*

July 1, 1906, balance unexpended.....	\$2,589.61
Amount appropriated by river and harbor act approved March 2, 1907.....	10,000.00
	12,589.61
June 30, 1907, amount expended during fiscal year, for works of improvement.....	4,191.94
July 1, 1907, balance unexpended.....	8,397.67
July 1, 1907, outstanding liabilities.....	172.40
July 1, 1907, balance available.....	8,225.27

## APPROPRIATIONS.

June 10, 1872.....	\$10,000.00
March 3, 1873.....	50,000.00
August 14, 1876.....	13,000.00
June 18, 1878.....	15,000.00
March 3, 1879.....	6,000.00
August 5, 1886.....	18,000.00
August 11, 1888 (allotted from appropriation for Red River).....	5,000.00
September 19, 1890 (for survey).....	10,000.00
July 13, 1892 (for survey).....	2,000.00
July 13, 1892 (allotted from appropriation for Red River).....	1,701.33
August 18, 1894.....	10,000.00
June 3, 1896.....	5,000.00
March 2, 1907.....	10,000.00
Total.....	155,701.33

## COMMERCIAL STATISTICS.

Freight was handled principally in barges towed by gasoline launches.

	Tons.		Tons.
Live stock.....	960	Railroad ties.....	50
Piling.....	420	Feed and provisions.....	30
Shingles.....	213	Miscellaneous.....	30

## V 5.

## IMPROVEMENT OF RED RIVER BETWEEN FULTON, ARKANSAS, AND DENISON, TEXAS.

Four quarter boats were at work on the river during a portion of the year. One was returned to the Vicksburg district, from which it had been borrowed, and one was lent to the Cypress Bayou improvement.

On May 30, 1907, one was torn loose from its moorings, broken up, and sunk by flood. The remaining one has been repaired, two new ones are being built, and a snag boat is in course of construction for the work during the fiscal year ending June 30, 1908. During the year the work done was as follows:

Snags destroyed.....	2,383	Logs removed.....	220
Stumps destroyed.....	521	Jams destroyed.....	80
Shore snags cut.....	6,487	Trees cut from caving banks..	171,368

*Money statement.*

July 1, 1906, balance unexpended.....	\$48,620.63
Amount appropriated by river and harbor act approved March 2, 1907.....	100,000.00
	<hr/> 148,620.63
June 30, 1907, amount expended during fiscal year, for works of improvement.....	16,176.72
July 1, 1907, balance unexpended.....	132,443.91
July 1, 1907, outstanding liabilities.....	2,058.85
	<hr/> 130,385.06
July 1, 1907, balance available.....	<hr/> 130,385.06
July 1, 1907, amount covered by uncompleted contracts.....	21,840.00

## APPROPRIATIONS.

August 5, 1886.....	\$7,000
August 11, 1888.....	3,000
September 19, 1890.....	2,000
July 13, 1892.....	3,500
August 17, 1894.....	3,500
June 3, 1896.....	3,000
June 13, 1902.....	10,000
March 3, 1905.....	100,000
March 2, 1907.....	100,000
	<hr/>
Total.....	232,000
February 23, 1901, received from sale of snag boat.....	1,500
	<hr/>
Total.....	233,500

## CONTRACTS IN FORCE.

Name of contractor: M. A. Sweeney Shipyard and Foundry Company.  
 Character of work: Construction and delivery of one snag boat.  
 Price: \$21,840.  
 Date of approval: April 17, 1906.  
 Date of beginning work: April 20, 1906.  
 Date of expiration of work: December 17, 1906.<sup>a</sup>

## COMMERCIAL STATISTICS.

No reports have been received from boats operating on this stretch of the river. Partial reports show 7,900,000 feet B. M. of saw logs moved by raft.

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•V 6.

## IMPROVEMENT OF SULPHUR RIVER, TEXAS AND ARKANSAS.

Plans for quarter boat have been made and material for its construction ordered.

*Money statement.*

Amount appropriated by river and harbor act approved March 2, 1907	\$36,000.00
July 1, 1907, balance unexpended	36,000.00

---

APPROPRIATIONS.

August 18, 1894 (allotted from appropriation for Red River)	\$2,488.99
March 2, 1907	36,000.00
Total	38,488.99





## APPENDIX W.

### IMPROVEMENT OF RED RIVER BELOW FULTON, ARKANSAS, AND OF CERTAIN RIVERS AND WATERWAYS IN LOUISIANA, ARKANSAS, AND MISSISSIPPI, TRIBUTARY TO MISSISSIPPI RIVER.

REPORT OF CAPT. G. M. HOFFMAN, CORPS OF ENGINEERS, OFFICER IN CHARGE, FOR THE FISCAL YEAR ENDING JUNE 30, 1907.

#### IMPROVEMENTS.

- |   |  |
|---|--|
| 1. Red River, Louisiana and Arkansas, below Fulton, Arkansas.   | 4. Mouth of Yazoo River and harbor at Vicksburg, Mississippi.                              |
| 2. Ouachita and Black rivers, Arkansas and Louisiana.   | 5. Yazoo, Tallahatchie, Coldwater, and Big Sunflower rivers, and Tchula Lake, Mississippi. |
| 3. Bayou Bartholomew, Boeuf River, Tensas River and Bayou Maçon, and Bayous D'Arbonne and Corney, Louisiana and Arkansas. |  |

UNITED STATES ENGINEER OFFICE,  
*Vicksburg, Miss., July 8, 1907.*

GENERAL: I have the honor to send herewith annual reports for the fiscal year ending June 30, 1907, upon the works of river and harbor improvement of the Vicksburg, Miss., district.

Very respectfully, your obedient servant,

G. M. HOFFMAN,  
*Captain, Corps of Engineers.*

Brig. Gen. A. MACKENZIE,  
*Chief of Engineers, U. S. A.*

#### W I.

### IMPROVEMENT OF RED RIVER, LOUISIANA AND ARKANSAS, BELOW FULTON, ARK.

Work for the improvement of the river below Fulton, Ark., to the head of Atchafalaya River, Louisiana, was continued during the fiscal year ending June 30, 1907, under the direct supervision of Mr. H. M. Marshall, assistant engineer, as follows:

#### GENERAL IMPROVEMENT.

Operations of the U. S. snag boat *C. W. Howell* were continuous, except during short periods when the boat was undergoing minor

repairs, and extended over the river from Fulton, Ark., to Normand Landing, La., 445 miles below. The *Howell* was in command of Robert Elfein, master, until July 22, 1906, and of James H. Britton, master, after that date.

The following is a summary of the work performed by the *Howell* during the year:

Snags pulled and destroyed.....	1,593
Stumps pulled and destroyed.....	217
Logs removed from channel.....	5
Shore snags cut.....	632
Jams broken up and destroyed.....	4
Side jams broken up and destroyed.....	2
Leaning trees felled and cut up.....	13,554
Trees girdled.....	17
Square yards of willows and brush cut.....	779
Piles driven in dikes at Rattling Slough.....	61

#### AT RATTLING SLOUGH, LOUISIANA.

At this locality, about 135 miles below Fulton, rapid caving threatened the Red Bayou levee, built by the United States in 1895-6 (see report for 1896, p. 1576), and August 10, 1906, an allotment of \$10,000 was authorized for protecting the bank and to prevent a crevasse.

Work commenced September 24, as soon as a temporary plant could be procured and delivered, and was completed December 22, 1906. Four permeable dikes were built along the right (caving) bank, and each consists of a double row of piles driven as close together as possible and so that the interstices in the first row are covered by the piles of the second row. The dikes were carried back from the top of the bank 15 to 20 feet and the inshore ends were protected against wash by riprap. The top of the dikes, from the bank out, have rather a steep slope down to about low water at the outer ends.

The first or upper dike is 186 feet long and contains 331 piles. The second dike, 330 feet downstream, is 143 feet long and contains 226 piles. The third dike, 475 feet below the second, is 144 feet long and contains 272 piles. The fourth dike, 575 feet below the third, is 181 feet long and contains 322 piles. A fifth dike was commenced, between Nos. 3 and 4, but only 84 piles had been driven when operations were suspended by high water.

The snag boat *Howell* was employed in towing the plant from Shreveport to Rattling Slough and in removing raft along the left bank of the river, to aid in diverting the current from the opposite side, and in April, 1907, the snag boat drove 61 piles to repair and strengthen the dikes.

A resurvey, the latter part of February, 1907, showed that the channel at upper end of the work had moved away from the dike, but at the lower end no change appeared.

#### AT ALEXANDRIA, LA.

The river and harbor act approved March 3, 1905, provided that of the amount appropriated for improving Red River below Fulton, "fifteen thousand dollars may, in the discretion of the Secretary of

War, be spent in the improvement of the channel at Alexandria, Louisiana." Action under this provision was deferred for reasons stated in the last Annual Report (1906, p. 1360).

Appropriations amounting to \$65,000 were expended for improvement of the river along the front of Alexandria, and the work consisted chiefly of dredging a channel through the rock shoals, known as the upper falls and the lower falls, constructing at the lower falls a rock-fill contraction dike on the west bank, building up of the old civil war dam opposite into another contraction dike, and building a crib and stone protection dike at the upper end of the town. In addition, considerable quantities of the rock dredged from the channel were deposited along the bank in front of the town to prevent caving, which eventually would have necessitated the relocation of the levee and the consequent throwing out of valuable town property. These works admirably accomplished the purposes for which intended. Low-water depths were increased, caving between the two dikes not only was checked, but an enormous deposit filled up the bend between, and the bank line along the town front below remained practically the same for twenty-three years.

A reexamination in December, 1906, indicated that additional work was needed to maintain the existing dikes, depths having increased considerably at the lower dike and the bank having caved along the shore end, threatening flanking; and March 1, 1907, a project was approved authorizing the expenditure of the available funds, or so much thereof as may be necessary, to repair and strengthen the dikes and reestablish their full effect.

This work has been deferred until the period of low water.

The amounts expended during the year and the unexpended balances July 1, 1907, were as follows:

Allotments.	Expended during year.	Balances unexpended July 1, 1907.
General improvement.....	\$21,470.25	\$221,180.48
At Shreveport, La.....		9,308.96
At Alexandria, La.....	19.92	14,843.16
At Ratfing Slough, La.....	9,884.07	145.98
Total.....	81,374.24	244,978.48

The unexpended balances are to be applied to the purposes designated in the column of allotments.

#### *Money statement.*

July 1, 1906, balance unexpended.....	\$126,205.47
Amount received from sales.....	147.25
Amount appropriated by river and harbor act approved March 2, 1907.....	150,000.00
	276,352.72
June 30, 1907, amount expended during fiscal year, for maintenance of improvement .....	31,374.24
July 1, 1907, balance unexpended.....	244,978.48
July 1, 1907, outstanding liabilities.....	2,481.21
July 1, 1907, balance available.....	242,497.27

The appropriations for early work, from 1828 to 1852, were as follows:

May 23, 1828.....	\$25,000.00	March 3, 1841.....	\$75,000.00
March 2, 1831.....	187.50	March 2, 1847.....	7,150.00
July 3, 1832.....	22,628.00	August 30, 1852.....	100,000.00
June 28, 1834.....	50,000.00		
March 3, 1835.....	50,000.00	Total.....	535,765.50
July 2, 1836.....	40,800.00	Amount expended.....	532,219.90
	30,000.00		
March 3, 1837.....	65,000.00	Amount carried to surplus	
April 20, 1838.....	70,000.00	fund.....	3,545.60

The appropriations since 1872 have been as follows:

June 10, 1872.....	\$20,000	August 2, 1882.....	\$75,000
	150,000	July 5, 1884.....	75,000
March 3, 1873.....	80,000	August 5, 1886.....	75,000
June 23, 1874.....	50,000	August 11, 1888.....	65,000
March 3, 1875.....	20,000		35,000
August 14, 1876.....	35,000	September 19, 1890.....	100,000
April 10, 1869.....	4,500		28,000
February 7, 1878.....	6,000	July 13, 1892.....	145,000
June 18, 1878.....	24,000	August 18, 1894.....	150,000
	25,000	June 3, 1896.....	100,000
	15,000	March 3, 1899.....	150,000
March 3, 1879.....	22,500	June 13, 1902.....	125,000
	10,000	March 3, 1905.....	100,000
	25,000	March 2, 1907.....	150,000
June 14, 1880.....	60,000		
	10,000	Total.....	1,950,000
	10,000		
March 3, 1881.....	10,000		
	10,000		

Receipts from sales.....	\$5,416.97
Refundments of overpayments.....	43.11

#### COMMERCIAL STATISTICS.

*List of steamboats in the Red River trade during the fiscal year.*

Name.	Class.	Tonnage.	Length.	Breadth.	Depth.	Draft.		Between—	Round trips.	Passengers.
						Light.	Loaded.			
Will Davis & c.....	Stern wheel.	150	Feet. 101	Feet. 25	Feet. 3.6	Feet. 1.7	Feet. 2.2	New Orleans and various points.	.....	.....
Red River.....	do.....	97	155	24	3.6	1.6	.....	New Orleans and Shreveport, La.	8	243
Rosie Estes.....	do.....	76	119.9	21.0	4.3	1.7	3.5	New Orleans and Coushatta, La.	14	
Geo. L. Bass.....	do.....	58	91	21.0	3.3	1.5	.....	Shreveport and various points.	50	
Advance &.....	do.....	17	69	11.2	2.9	2.0	.....	Boyce and Coushatta, La.; Boyce and Alexandria, La.	.....	.....
Mary Jane.....	do.....	17	69	11.2	2.9	2.0	.....	Shreveport and various points.	.....	.....
Will H. Wood & c.....	Tug.....	40	44	72.2	16.6	7.6	1.1 4.2	Not reported.....	.....	.....
Lola S.....	Propeller.....	8	.....	.....	.....	3.5	4.0	Red River Landing and mouth of Black River.	.....	.....
								Simmesport and various points.	.....	.....

\* Allotment made August 27, 1877, for closing Tones Bayou.

† Towboat.

• With one or more barges.

*Summary of commerce reported.*

Articles.	Tons.	Value.	Articles.	Tons.	Value.
Cotton.....	3,018	\$908,870	Provisions.....	1,772	\$118,155
Cotton seed.....	5,131	82,096	Grain.....	177	5,520
Live stock.....	75	4,500	Miscellaneous.....	29,622	466,045
Lumber.....	258	3,462			
Staves.....	12,195	146,337	Total.....	112,278	1,879,985
Saw logs.....	60,000	150,000			

## W 2.

## IMPROVEMENT OF OUACHITA AND BLACK RIVERS, ARKANSAS AND LOUISIANA.

## GENERAL IMPROVEMENT.

From July 1 to November 26, 1906, a force of laborers, equipped with tools, tackle, and explosives, upon U. S. quarter boat *No. 7*, and under Overseer George H. Steele, worked from Whitehall Landing, Ark., downstream to a point about 7 miles below Monroe, La., a distance of 162 miles, and removed the following obstructions to navigation:

Channel snags cut and destroyed.....	1,236
Shore snags cut.....	1,329
Logs removed from channel.....	45
Logs cut up along banks.....	2,961
Slide jams broken up and destroyed.....	44
Stumps destroyed.....	309
Tree slides removed.....	7
Trees removed from channel.....	64
Leaning trees felled and cut up.....	4,602
Trees girdled.....	5,174
Square yards of willows and brush cut.....	42,700

After suspending work in Tensas River the party on U. S. quarter boat *No. 3*, under Foreman D. B. Nailer, worked from October 11 to November 30, 1906, over Black River and the lower Ouachita below Columbia to Trinity, a stretch of 124 miles, and removed the following obstructions to navigation:

Channel snags destroyed.....	242
Shore snags cut.....	2,480
Logs removed from channel.....	25
Slide jams broken up and destroyed.....	9
Stumps destroyed.....	58
Leaning trees felled and cut up.....	593
Trees girdled.....	580

The construction at Jeffersonville, Ind., under contract, of a new steel snag boat to replace the *O. G. Wagner* was continued during the year, and on June 30, 1907, this boat was about 50 per cent complete.

## LOCKS AND DAMS NOS. 4 AND 6.

Contract work at Lock No. 4 near Monroe, La., resumed June 28, 1906, was continued the first half of July; but a rapid rise of the river set in July 15, and July 18 leakage of the small cofferdam became so great that it was allowed to fill and operations were suspended. This rise continued until August 7, reaching a height of

44.5 feet, and then declined slowly. The building of a large cofferdam, commenced in July, was continued the latter half of August after the fall set in, and was completed in September. Several efforts were made to unwater this dam, but it finally failed the night of September 23, 1906, when a large hole scoured under the sheet piling. Construction work within the small cofferdam was resumed the latter part of August, but was again stopped October 9, when a hole scoured under the sheeting and into the excavation for the core wall. A puddle dam to inclose the upper half of the lock was commenced at once, but a rapid rise stopped this work November 21, and high stages continued until June 30, 1907.

Payments on the contract during the year were as follows:

*Lock and Dam No. 4.*

Construction work:

Foundation piles (driven), 25,114 linear feet, at 25 cents-----	\$6, 278. 50
Excavated material, 618 cubic yards, at 75 cents-----	463. 50
Framed timber, 610 feet B. M., at \$30 per 1,000 feet-----	18. 30
Sheet piling, 1,317 linear feet, at 65 cents-----	856. 05
Portland cement concrete, 109 cubic yards, at \$7.50-----	817. 50
	<hr/>
	8, 433. 85
Less 10 per cent reserved-----	\$843. 38
Less previous payments for material delivered-----	2, 223. 85
	<hr/>
	3, 067. 23
Amount paid-----	<hr/>
	5, 366. 62

Material delivered:

Gravel for concrete, 64,000 cubic yards, at 75 cents-----	4, 800. 00
Lumber, 91,000 feet B. M., at \$18 per 1,000 feet-----	1, 638. 00
Foundation piles, 31,000 linear feet, at 10 cents-----	3, 100. 00
Portland cement, 1,590 barrels, at \$1.75-----	2, 782. 50
	<hr/>
	12, 320. 50
Less 10 per cent reserved-----	1, 232. 05
	<hr/>
Amount paid-----	11, 088. 45
Total amount paid-----	<hr/>
	16, 455. 07

LOCKS AND DAMS NOS. 2 AND 8.

The river and harbor act approved March 2, 1907, appropriated \$160,780 for beginning the construction of Lock and Dam No. 2 near Catahoula shoals, Louisiana, and Lock and Dam No. 8 near Franklin shoals, Arkansas, and provided for their completion under the continuing-contract method at an additional cost not to exceed \$360,823.

Preliminaries to acquiring the site of Lock and Dam No. 8 have been completed, plans and specifications have been prepared and submitted and it is expected to advertise for proposals in July.

Surveys and borings at Lock and Dam No. 2 will be made as soon as the stages permit, and that work will be advertised as early as possible.

The work for general improvement of the river was conducted under the local supervision of Mr. H. M. Marshall, assistant engineer. The construction of locks and dams was under the immediate supervision of Mr. T. C. Thomas, assistant engineer.

The amounts expended during the year and the unexpended balances July 1, 1907, were as follows:

Allotments.	Expended during year.	Balances unexpended July 1, 1907.
Maintenance of improvement.....	\$9,556.41	\$38,645.71
Dredging at Catahoula shoals.....		10,000.00
Building snag boat.....	15,293.88	34,650.77
Completion of survey.....		278.70
Locks and Dams Nos. 4 and 6.....	20,153.83	358,147.25
Locks and Dams Nos. 2 and 8.....	2,777.56	158,002.44
Total.....	47,781.18	599,724.87

The balances are to be applied to the purposes designated above in the column of allotments.

*Money statement.*

July 1, 1906, balance unexpended.....	\$446,721.80
Amount received from sales of property.....	4.25
Amount appropriated by river and harbor act approved March 2, 1907.....	200,780.00
	647,506.05
June 30, 1907, amount expended during fiscal year:	
For works of improvement.....	\$22,930.89
For constructing snag boat.....	15,293.88
For maintenance of improvement.....	9,556.41
	47,781.18
July 1, 1907, balance unexpended.....	599,724.87
July 1, 1907, outstanding liabilities.....	983.50
July 1, 1907, balance available.....	598,741.37
July 1, 1907, amount covered by uncompleted contracts.....	425,236.84
Amount (estimated) required for completion of existing project....	<sup>a</sup> 401,135.00
{ Amount that can be profitably expended in fiscal year ending June 30, 1909, for works of improvement, in addition to the balance unexpended July 1, 1907.....	
Submitted in compliance with requirements of sundry civil act of June 4, 1897.	
	401,135.00

The appropriations have been as follows:

March 3, 1871.....	\$25,000	August 18, 1894.....	\$50,000
March 3, 1871.....	26,000	June 3, 1896.....	70,000
June 10, 1872.....	60,000	March 3, 1899.....	110,000
June 10, 1872.....	40,000	June 13, 1902.....	31,500
March 3, 1873.....	60,000	June 13, 1902.....	80,000
August 14, 1876.....	12,000	March 3, 1903.....	250,000
June 18, 1878.....	10,000	March 3, 1905 (river and harbor act).....	80,000
March 3, 1879.....	10,000	March 3, 1905 (sundry civil act).....	12,000
June 14, 1880.....	8,000	June 30, 1906 (sundry civil act).....	91,954
March 3, 1881.....	12,000	March 2, 1907 (river and harbor act).....	200,780
August 2, 1882.....	12,000		
July 5, 1884.....	15,000	Total.....	1,358,734
August 5, 1886.....	17,500		
August 11, 1888.....	20,000	Receipts from sales.....	\$1,544.21
September 19, 1890.....	15,000	Refundments of overpayments.....	145.35
July 13, 1892.....	40,000		

<sup>a</sup> The estimate for completion refers only to that part of the project authorized by Congress for construction of Locks and Dams Nos. 2, 4, 6, and 8 at a cost of \$995,869.

## CONTRACTS IN FORCE.

No. 1.—Name of contractor: Chicago Engineering and Constructing Company.  
Character of work: Construction of Locks and Dams Nos. 4 and 6, Ouachita River, Louisiana and Arkansas.

Date of original contract: September 7, 1904. Supplementary contracts dated April 24 and September 6, 1905.

Date of approval of original contract: September 26, 1904.

Supplementary contracts approved: June 14 and September 26, 1905.

Date of beginning work: October 28, 1904.

Date contract expires: Time limit waived.

*Details and prices.*

Classification.	Approximate quantities.		Unit prices.	
	No. 4.	No. 6.	No. 4.	No. 6.
Lock keeper's dwellings.....number..	1	1	\$4,800.00	\$4,800.00
Maneuvering boats.....do.....	1	1	3,500.00	3,500.00
Valves for 20-inch pipe.....do.....	4	4	200.00	200.00
Winches.....do.....	2	2	125.00	125.00
Grubbing and clearing.....acres..	2	11	200.00	200.00
Excavated material.....cubic yards..	7,219	14,816	.75	.75
Portland cement concrete.....do.....	13,830	11,943	7.50	8.00
Gravel filling.....do.....	1,000	1,000	1.50	1.50
Back fill and embankment.....do.....	9,796	7,200	.60	.60
Concrete paving.....square yards..	3,140	1,570	2.00	2.00
Miter sills, posts, etc. (oak).....feet B. M..	8,852	8,268	a50.00	a50.00
Framed timber (including drum and drum chamber).....feet B. M..	15,714	15,014	a30.00	a30.00
Needles.....do.....	22,159	21,214	a60.00	a60.00
Sheet piling.....linear feet..	37,756	24,532	.65	.65
Foundation piles (driven).....do.....	83,555	50,302	.25	.30
Drain pipe, 4-inch unglazed tile.....do.....	500	500	.20	.20
Cast-iron pipe (20-inch diameter).....do.....	97	74	6.50	6.50
Structural steel.....pounds..	235,312	278,773	.104	.104
Cast iron.....do.....	64,306	58,522	.084	.084
Bolts, special irons, etc.....do.....	9,000	9,000	.08	.08
Sprocket chain.....do.....	2,700	2,700	.08	.08
Chain.....do.....	2,200	1,900	.084	.084
Steel bars (1-inch).....do.....	14,171	10,938	.06	.06
Riprap.....tons..	1,680	1,690	3.60	4.60
Mound embankment.....cubic yards..		21,463		.60

<sup>a</sup> Per 1,000 feet B. M.

No. 2.—Name of contractor: Ed J. Howard, Jeffersonville, Ind.  
Character of work: Construction and delivery of steel snag boat.

Date of contract: April 2, 1906.

Date of approval: April 14, 1906.

Date of beginning work: April 26, 1906.

Date contract expires: Time limit waived.

Price of boat: \$42,483.



## COMMERCIAL STATISTICS.

*List of boats engaged in the Ouachita River trade during the fiscal year.*

Name.	Class.	Tonnage.	Length.	Breadth.	Depth.	Draft.		Between—	Round trips.	Passengers.
						Light.	Loaded.			
Bob Blanks.....	Stern-wheel.	265	175.0	35.0	5.0	3.0	.....	New Orleans and Monroe, La.	29	3,781
Concordia.....	do	156				1.2	5.0	New Orleans and various points.	9	
Verne Swain.....	do	98	130.4	28.8	4.7	1.2	.....	Natchez, Miss., and Harrisonburg, La.	52	526
Columbia.....	do	139	170.0	29.0	4.0	2.0	.....	do.	86	
Controla.....	do	108	118.5	27.4	4.6	.....	.....	New Orleans and Columbia, La.	3	1,780
Frank B. Hayne.....	do	90	130.4	27.0	4.0	2.0	.....	New Orleans and Monroe, La.	6	
F. A. Goebel <sup>a</sup> .....	do	61	111.3	20.3	3.0	2.0	.....	New Orleans and various points.	8	312
								Monroe and Ouachita City, La., and Locks 4 and 6.		
Handy.....	do	49	110.0	22.0	3.0	2.0	.....	Monroe, La., and Camden, Ark.	13	268
								Monroe, La., and Champagnolle, Ark.	9	
Welcome <sup>b</sup> .....	Gasoline....	14	61.0	14.0	2.3	1.1	.....	Monroe, La., and Camden, Ark.	1	6
								Monroe, La., and various points.	74	

<sup>a</sup> Towboat.<sup>b</sup> With one or more barges.*Summary of commerce reported.*

Articles.	Tons.	Value.	Articles.	Tons.	Value.
Cotton.....	19,021	\$5,706,860	Provisions.....	13,140	\$376,085
Cotton seed.....	5,253	84,064	Grain.....	4,473	139,770
Live stock.....	544	32,670	Miscellaneous.....	40,839	1,127,818
Lumber.....	2,435	29,220			
Staves.....	16,103	182,407	Total.....	171,952	8,353,744
Saw logs.....	70,144	175,360			

## W 3.

IMPROVEMENT OF BAYOU BARTHOLOMEW, BOEUF RIVER, TENSAS RIVER AND BAYOU MAÇON, AND BAYOUS D'ARBONNE AND CORNEY, LOUISIANA.

Operations in these tributaries of Ouachita River during the fiscal year ending June 30, 1907, were continued under the local supervision of Mr. H. M. Marshall, assistant engineer, as follows:

## (A) BAYOU BARTHOLOMEW.

The work in progress at close of last fiscal year (see Report of 1906, p. 1370) by a party under Overseer Frank C. Breese, on U. S. quarter boat *No. 6*, was carried upstream to McComb Landing, Arkansas, the present head of navigation, and thence back to the mouth of the bayou, 141 miles below. This work was completed October 13, after which the boat and party were transferred to Bayou D'Arbonne.

The following is a summary of the work performed in Bayou Bartholomew:

Channel snags destroyed .....	2, 926
Stumps destroyed .....	326
Shore snags cut .....	2, 180
Logs removed from channel .....	622
Side jams broken up and destroyed .....	8
Leaning trees felled and cut up .....	2, 264
Fallen trees chopped up .....	400
Trees girdled .....	604
Square yards of willows and brush cut .....	4, 113
Wreck removed (sunken barge at mouth of Chemin en haut Creek) .....	1

*Money statement.*

July 1, 1906, balance unexpended .....	\$4, 681. 70
Amount appropriated by river and harbor act approved March 2, 1907 .....	5, 000. 00
	<hr/>
	9, 681. 70
June 30, 1907, amount expended during fiscal year, for maintenance of improvement .....	4, 269. 14
	<hr/>
July 1, 1907, balance unexpended .....	5, 412. 56

(B) BOEUF RIVER.

The funds available for this stream were not sufficient to resume operations until after the act of March 2, 1907, and since then the stages have been too high for effective work.

Maintenance of the Boeuf River improvement, over a section 100 miles long, will be dependent on the closure of an outlet into Lake La Fourche, near Point Jefferson, Louisiana.

The outlet and its three branches were examined in 1884 and report thereon is published in Annual Report, Chief of Engineers, 1885, page 1545. Reference to this matter since then will be found in annual reports as follows: 1885, page 1503; 1887, page 1462; 1888, page 1353; 1889, page 1603; 1890, page 1886; 1891, page 1986; 1892, page 1614; 1893, page 2016; 1894, page 1477; 1895, page 1921; 1896, page 1605; 1897, page 1917; 1898, page 1614; 1899, page 2003.

The report of the examination in 1884 stated that the outlet was an injury to navigation by reason of depletion due to escape through it of the water from the main channel. An appropriation of \$5,000 was made by river and harbor act of August, 1886, for closing the three branches, and the work estimated to cost \$7,290 was finished in 1898, the necessary additional funds being furnished by interested local planters. A map<sup>a</sup> herewith shows the location and extent of this work. Due to the general failure of the Arkansas River and the Mississippi River levees, a great flood was poured into Boeuf River, which breached all three of the dikes constructed; their reconstruction at an estimated cost of \$12,500 was immediately recommended by the officer in charge, who stated that "the closure of these outlets is absolutely essential to maintaining Bayou Boeuf as a navigable river, and if they are left open no more should be expended for its improvement." This has been confirmed by actual results; owners and officers of boats have reported navigation on Boeuf River as becom-

<sup>a</sup> Not printed.

ing more and more difficult. Reexaminations were made in 1891 and 1893 and recommendations made for appropriations, increased in the latter to \$30,000. As no action was taken by Congress, the small appropriations for maintenance were allowed to accumulate until, in 1899, there was an available balance of \$14,058.46. As this was only 40 per cent of the amount required, the work of closing the outlet was not undertaken, and thereafter money available was expended for purposes of general improvement.

Interest in the project has been revived through the necessity of draining Bayou Lafourche basin to permit the development of a rich tract of land comprising 220,800 acres, much of which is converted into a swamp and all of which is seriously affected by the overflow of flood water from Boeuf River. A map<sup>a</sup> is submitted herewith showing the situation and such elevations as are available, from which it may be seen that the basin generally is considerably lower than flood water in Boeuf River and that the closure of the outlet into Lake Lafourche will operate to reclaim this area from damage by floods. Furthermore, it will render practicable the drainage of nearly all this territory at a moderate expense; surveys for this purpose have already been made, but it is recognized that nothing can be accomplished in this direction as long as the outlet above remains open.

An appropriation of \$30,000 for this work is recommended as urgent.

*Money statement.*

July 1, 1906, balance unexpended-----	\$1, 042. 77
Amount appropriated by river and harbor act approved March 2, 1907-----	5, 000. 00
	<hr/> 6, 042. 77
December 8, 1906, amount transferred to Bayou Maçon-----	400. 00
	<hr/> 5, 642. 77
July 1, 1907, balance unexpended and available-----	<hr/> <hr/> 5, 642. 77
<div style="display: flex; align-items: center;"> <div style="font-size: 3em; margin-right: 10px;">{</div> <div>           Amount that can be profitably expended in fiscal year ending June 30, 1909, for maintenance of improvement, in addition to the balance unexpended July 1, 1907-----         </div> <div style="margin-left: 20px; text-align: right;">30, 000. 00</div> </div>	
<div style="display: flex; align-items: center;"> <div style="font-size: 3em; margin-right: 10px;">{</div> <div>           Submitted in compliance with requirements of sundry civil act of June 4, 1897, and of section 7 of the river and harbor act of 1899.         </div> </div>	

(C) TENSAS RIVER AND BAYOU MAÇON.

The work in progress June 30, 1906 (see report for 1906, p. 1369), by a party on U. S. quarter boat *No. 3*, was carried from Montgomery Landing down Bayou Maçon to its mouth, 107 miles, and thence down Tensas River 69 miles to its mouth. Overseer Cook was succeeded by Overseer John W. Baxter August 1, 1906, and Foreman D. B. Nailer was placed in charge of the party September 17, 1906. Operations were suspended October 10, 1906, and the party was transferred to Black River.

<sup>a</sup> Not printed.

The following obstructions to navigation were removed during the period July 1 to October 10, 1906:

Channel snags destroyed.....	799
Stumps destroyed.....	114
Shore snags cut.....	1, 138
Logs removed from channel.....	209
Leaning trees felled and cut up.....	13, 739
Trees girdled.....	5, 342
Square yards of willows and brush cut.....	9, 044
Wrecks removed (part of steamer <i>H. J. Dickey</i> , sunk January, 1891, above Delhi, La., and a sunken flatboat).....	2

Excessive rains in November caused a rapid rise of Bayou Maçon and heavy drift was brought down and lodged against the pier and abutments of the Vicksburg, Shreveport and Pacific Railway drawbridge near Delhi, La. November 27, 1906, a force of 20 laborers was transferred from Ouachita River to remove the jam, but the available funds ran out before the work could be completed, and it was suspended December 11. Transfers of \$400 each from the unexpended balances for "bayous D'Arbonne and Corney" and "Boeuf River" were authorized by the Secretary of War December 8, notification of which was received December 15. Work was resumed the latter date, but during the short interval the water had receded from 20 feet on the gauge to 7 feet, leaving the drift aground and piled up against the piers. The jam was broken up with high explosives, pulled loose with lines and steam power, and allowed to float away. The accumulations on the banks were chopped up and partly burned. The work was performed under local direction of Overseer J. H. Bobbs.

*Money statement.*

July 1, 1906, balance unexpended.....	\$3, 801. 78
December 8, 1906, transferred from Boeuf River and bayous D'Arbonne and Corney.....	800. 00
Amount appropriated by river and harbor act approved March 2, 1907.....	5, 000. 00
	9, 601. 78
June 30, 1907, amount expended during fiscal year, for maintenance of improvement .....	4, 499. 64
July 1, 1907, balance unexpended.....	5, 102. 14
July 1, 1907, outstanding liabilities.....	28. 56
	5, 073. 58

(D) BAYOUS D'ARBONNE AND CORNEY.

The party on quarter boat *No. 6*, under Overseer Breese, worked in Bayou D'Arbonne from October 18 to November 16, 1906. Operations were carried upstream about 13 miles, and were suspended the latter date, as it was found impracticable for the quarter boat to proceed farther at the low stage.

The following obstructions to navigation were removed:

Channel snags destroyed.....	199
Stumps destroyed.....	373
Shore snags cut.....	321
Logs removed from channel.....	273
Leaning trees felled and cut up.....	640
Fallen trees chopped up.....	85
Square yards of willows and brush cut.....	5,525

May 17–19, 1907, U. S. quarter boat *No. 7* was towed from Monroe to Farmerville, La., near the mouth of Bayou Corney, preparatory to resuming work as soon as the streams reach favorable stages.

### Money statement.

July 1, 1906, balance unexpended.....	\$2,436.42
Amount appropriated by river and harbor act approved March 2, 1907.....	2,000.00
	4,436.42
June 30, 1907, amount expended during fiscal year for maintenance of improvement.....	\$1,969.03
December 8, 1906, transferred to Bayou Maçon.....	400.00
	2,369.03
July 1, 1907, balance unexpended.....	2,067.39
July 1, 1907, outstanding liabilities.....	238.72
July 1, 1907, balance available.....	1,828.67

The appropriations for the improvement of these streams have been as follows:

By act of—	Bayou Bartholomew.	Boeuf River.	Tensas River and Bayou Maçon.	Bayous D'Arbonne and Corney.	Total.
March 3, 1881.....	\$8,000	\$5,000	\$3,000	.....	\$16,000
August 2, 1882.....	5,000	5,000	.....	.....	10,000
July 5, 1884.....	5,000	5,000	4,000	\$5,000	19,000
August 5, 1886.....	5,000	5,000	4,000	2,000	16,000
August 11, 1888.....	5,000	6,000	5,000	2,000	18,000
September 19, 1890.....	5,000	5,000	5,000	2,000	17,000
July 18, 1892.....	5,000	10,000	5,000	4,000	24,000
August 18, 1894.....	5,000	8,000	5,000	2,000	20,000
June 3, 1896.....	4,000	6,000	5,000	.....	15,000
March 3, 1899.....	5,000	6,000	4,000	.....	15,000
June 13, 1902 (allotments).....	5,000	3,500	4,000	2,500	15,000
March 3, 1906 (allotments).....	5,000	900	9,500	1,600	17,000
March 2, 1907 (allotments).....	5,000	5,000	5,000	2,000	17,000
Total amount appropriated.....	67,000	70,400	58,500	23,100	219,000

\* Act of August 18, 1894, also appropriated \$1,000 for Little D'Arbonne.

Refundment of overpayments (Boeuf River)..... \$32.45

### COMMERCIAL STATISTICS.

#### BAYOU BARTHOLOMEW.

*List of boats engaged in the trade during the fiscal year.*

Name.	Class.	Tonnage.	Length.	Breadth.	Depth.	Draft.		Between—	Round trips.	Passengers.
						Light.	Loaded.			
Handy.....	Stern wheel	49	Fect. 110	Fect. 22	Fect. 3.0	Fect. 2.0	Fect. ....	Monroe and Kelley Landing.	21	5

# 1506 REPORT OF THE CHIEF OF ENGINEERS, U. S. ARMY.

## Summary of commerce reported.

Articles.	Tons.	Value.	Articles.	Tons.	Value.
Cotton.....	550	\$164,970	Grain.....	80	\$2,500
Cotton seed.....	386	6,176	Miscellaneous.....	240	15,000
Staves.....	96	1,159	Total.....	1,502	199,805
Provisions.....	150	1,000			

## BAYOUS D'ARBONNE AND CORNEY.

### List of boats engaged in the trade during the fiscal year.

Name.	Class.	Tonnage.	Length.	Breadth.	Depth.	Draft.		Between—	Round trips.	Passengers.
						Light.	Loaded.			
Handy .....	Stern wheel	49	<i>Feet.</i> 110	<i>Feet.</i> 22	<i>Feet.</i> 3.0	<i>Feet.</i> 2.0	<i>Feet.</i> 2.0	Monroe and Farmerville, La.	1	2
E. B. Carter .....	Gasoline.....	8	54	10	2.5	1.0	2.0	do.....	30	90

## Summary of commerce reported.

Articles.	Tons.	Value.	Articles.	Tons.	Value.
Cotton.....	45	\$13,800	Grain.....	72	\$2,265
Cotton seed.....	12	191	Miscellaneous.....	125	8,290
Saw logs.....	36,000	90,000	Total.....	36,272	115,766
Provisions.....	18	1,220			

## BOEUF RIVER.

### List of boats engaged in the trade during the fiscal year.

[Not reported.]

## Summary of commerce reported.<sup>a</sup>

Articles.	Tons.	Value.
Staves.....	1,517	\$18,200

<sup>a</sup> Only one report returned.

## TENSAS RIVER AND BAYOU MAÇON.

### List of boats engaged in the trade during the fiscal year.

Name.	Class.	Tonnage.	Length.	Breadth.	Depth.	Draft.		Between—	Round trips.	Passengers.
						Light.	Loaded.			
Concordia .....	Sternwheel.	156	<i>Feet.</i>	<i>Feet.</i>	<i>Feet.</i>	<i>Feet.</i> 1.2	<i>Feet.</i> 5.0	Jonesville and mouth of Bayou Maçon.	52	310
Verne Swain .....	do .....	98	130.4	27	4.0	1.2	.....	do.....	.....	.....
Frank B. Hayne .....	do .....	90	130.4	27	4.0	2.0	.....	Monroe and Warsaw, La.	2	.....
J. W. Swayze .....	do .....	86	110	22.6	3.8	2.0	3.0	Jonesville and various points.	.....	.....

*Summary of commerce reported.*

Articles.	Tons.	Value.	Articles.	Tons.	Value.
Cotton.....	3,243	\$972,810	Provisions.....	4,276	\$285,085
Cotton seed.....	7,619	121,907	Grain.....	2,332	72,897
Live stock.....	11	630	Miscellaneous.....	1,956	130,440
Lumber.....	618	7,860	Total.....	22,187	1,616,772
Staves.....	2,137	25,658			

## W 4.

## IMPROVEMENT OF MOUTH OF YAZOO RIVER AND HARBOR AT VICKSBURG, MISSISSIPPI.

The chief work performed during the fiscal year ending June 30, 1907, was that required for maintenance of West Pass levee, and consisted of cutting and burning the weeds and grass, planting willows to protect exposed stretches from wave wash, repairing and strengthening the wooden bulkheads, repairing damages from wave wash, and removing drift from the terraces during the decline of flood in February. Slope-gauge readings were continued during the year, and the gauges were repaired in July and November. Longitudinal soundings of the canal from Old River to Kleinston Landing were taken in August and October, and a general resurvey was made in November and December.

The wreck of the steamer *Elk*, sunk in Vicksburg Harbor, near the foot of Henry street, October 13, 1905, was destroyed by the U. S. snag boat *H. G. Wright* November 19–21, 1906.

The work was under the local supervision of Mr. T. C. Thomas, assistant engineer.

*Money statement.*

July 1, 1906, balance unexpended.....	\$15,294.94
July 30, 1907, amount expended during fiscal year, for maintenance of improvement.....	3,455.88
July 1, 1907, balance unexpended.....	11,839.06
July 1, 1907, outstanding liabilities.....	560.16
July 1, 1907, balance available.....	11,278.90

## APPROPRIATIONS—PREVIOUS PROJECTS.

[Harbor and Mississippi River at Vicksburg, Miss., and revetment work at Delta Point, La.]

June 18, 1878.....	\$84,000.00
March 3, 1879.....	50,000.00
June 14, 1880.....	20,000.00
March 3, 1881.....	75,000.00
Allotments by Mississippi River Commission.....	603,210.85
	832,210.85

Expended for work at—

Vicksburg Harbor.....	442,724.77
Delta Point.....	389,486.08

## APPROPRIATIONS—EXISTING PROJECT.

July 13, 1892 .....	\$75,000
August 18, 1894 .....	225,000
August 18, 1894 .....	40,000
June 4, 1897 .....	350,000
March 3, 1901 .....	510,000
Total .....	1,200,000

## W 5.

IMPROVEMENT OF YAZOO, TALLAHATCHIE, COLDWATER, AND BIG  
SUNFLOWER RIVERS, AND TCHULA LAKE, MISSISSIPPI.

Operations for maintenance of the improvement of Yazoo River and tributaries were continued during the fiscal year ending June 30, 1907, under the local supervision of Mr. H. M. Marshall, assistant engineer, as follows:

## (A) YAZOO RIVER.

The U. S. snag boat *Columbia*, John W. Baxter, master, was employed in Yazoo River from November 5 to 25 and from December 11 to 19, 1906. Operations extended from the mouth to the head of the river, and the following obstructions to navigation were removed:

Snags pulled .....	241
Stumps pulled and destroyed .....	51
Shore snags cut .....	57
Side jams broken up and destroyed .....	10
Leaning trees felled and cut up .....	192
Trees girdled .....	62

From September 22 to 29, 1906, the party on U. S. quarter boat *No. 2* (previously employed in Tchula Lake) worked in Yazoo River from the mouth of Tchula Lake downstream to Pluto Landing, 6 miles, and removed the following obstructions:

Channel snags destroyed .....	19
Stumps cut .....	111
Shore snags cut .....	643
Leaning trees felled and cut up .....	2,275

From November 8 to 23, 1906, the party on U. S. quarter boat *No. 8* (previously employed in Tallahatchie and Coldwater rivers) worked in Yazoo River from its head downstream to Sidon, and removed the following obstructions:

Shore snags cut .....	178
Stumps cut .....	134
Leaning trees felled and cut up .....	272
Trees girdled .....	73
Logs destroyed .....	6
Square yards of willows and brush cut .....	3,300

Work under contract at Jeffersonville, Ind., for the construction of a new steel snag boat to replace the *John R. Meigs* (destroyed in 1898) was continued during the year, and on June 30, 1907, was about 50 per cent completed.



*Money statement.*

July 1, 1906, balance unexpended.....	\$82,904.79
Amount appropriated by river and harbor act approved March 2, 1907.....	36,000.00
Amount received from sales of property.....	84.50
	<hr/>
	118,989.29
June 30, 1907, amount expended during fiscal year:	
For constructing snag boat.....	\$17,297.73
For maintenance of improvement.....	8,681.61
July 12, 1906, transferred to Tallahatchie River.....	5,000.00
	<hr/>
	30,979.34
July 1, 1907, balance unexpended.....	88,009.95
July 1, 1907, outstanding liabilities.....	735.40
	<hr/>
July 1, 1907, balance available.....	87,274.55
July 1, 1907, amount covered by uncompleted contracts.....	27,189.12

## (B) TALLAHATCHIE AND COLDWATER RIVERS.

An additional allotment of \$5,000 (by transfer from the allotment for Yazoo River) was authorized by the Secretary of War July 12, 1906, for continuing work in these streams.

The work in progress June 30, 1906, (Report for 1906, p. 1377), by a force of laborers on U. S. quarter boat *No. 8*, under Overseer James N. Ferguson, was continued until November 7, 1906, and was carried down Coldwater River to its mouth, and thence down Tallahatchie River to Locopolis.

The following is a summary of the work performed:

Channel snags and logs destroyed.....	1,090
Stumps cut and destroyed.....	808
Shore snags cut.....	1,316
Jams broken up and destroyed.....	4
Slide jams broken up and destroyed.....	3
Leaning trees felled and cut up.....	7,794
Leaning trees topped.....	3
Trees girdled.....	448
Square yards of willows and brush cut.....	90,400
Wrecks removed (upper works of sunken steamboats, names unknown, at Ellison Place and Lloyd Camp).....	2

A rapid rise occurred the early part of October, 1906, during which a heavy jam of drift formed at the Yazoo and Mississippi Valley Railroad bridge across Tallahatchie River at Philipp, Miss. This formation became so extensive that it was necessary to send the U. S. snag boat *Thos. B. Florence* from Vicksburg to assist the party on quarter boat *No. 8* in clearing away the obstruction and in opening a passageway for boats, which was accomplished October 21, 1906.

*Money statement.*

July 1, 1906, balance unexpended.....	\$1,105.19
July 12, 1906, transferred from Yazoo River.....	5,000.00
Amount appropriated by river and harbor act approved March 2, 1907.....	5,000.00
	<hr/>
	11,105.19
June 30, 1907, amount expended during fiscal year, for maintenance of improvement.....	5,581.95
July 1, 1907, balance unexpended.....	5,523.24

## (c) TALLAHATCHIE RIVER, BETWEEN BATESVILLE AND THE MOUTH OF COLDWATER RIVER.

The report submitted in House Document No. 147, Fifty-ninth Congress, first session, contained an estimate for expenditure of \$2,000 a year for a series of years to put this stretch of river (about 50 miles, in which no work has been performed by the United States since 1882) in such condition that boats which run in lower Tallahatchie River may reach Batesville from five to seven months in the year.

The river and harbor act approved March 2, 1907, provided \$4,000 for resuming work in accordance with this plan, and April 8 to 13 the U. S. snag boat *Columbia* towed quarter boat *No. 8* from Vicksburg to the mouth of Yocona River, 3 miles above the mouth of Coldwater River. The snag boat could proceed no farther with the tow on account of the thick growth of leaning trees and numerous snags. In May, at a moderately high stage, the quarter boat was cordelled upstream to Batesville. Active operations commenced at Batesville May 27 and at close of the year had been carried downstream 7 miles. The following obstructions to navigation were destroyed:

Logs destroyed .....	105
Stumps cut and destroyed .....	263
Shore snags cut .....	240
Side jams broken up and destroyed .....	7
Leaning trees felled and cut up .....	1,922
Trees girdled .....	12
Square yards of willows and brush cut .....	25,950
Logs removed from channel .....	26

*Money statement.*

Amount appropriated by river and harbor act approved March 2, 1907...	\$4,000. 00
June 30, 1907, amount expended during fiscal year, for maintenance of improvement .....	855. 37
July 1, 1907, balance unexpended .....	3,144. 63
July 1, 1907, outstanding liabilities .....	1,103. 06
July 1, 1907, balance available .....	2,041. 57

## (d) BIG SUNFLOWER RIVER.

U. S. quarter boat *No. 2* was moved into Big Sunflower River in October; active operations commenced October 4 and were continued until December 31, 1906. During this period work extended over the river between its mouth and a point 6 miles above Doddsville, in Sunflower County, and the following obstructions to navigation were removed:

Channel snags and logs destroyed .....	205
Stumps cut and destroyed .....	21
Shore snags cut .....	736
Jams broken up and destroyed .....	5
Leaning trees felled and cut up .....	11,924
Trees girdled .....	2,060
Square yards of willows and brush cut .....	8,293

Overseer J. H. Bobbs was in charge of this party until November 27, when he was succeeded by Overseer J. N. Ferguson.

*Money statement.*

July 1, 1906, balance unexpended.....	\$4,913. 16
Amount appropriated by river and harbor act approved March 2, 1907.....	100,000. 00
	104,913. 16
June 30, 1907, amount expended during fiscal year, for maintenance of improvement .....	3,550. 60
July 1, 1907, balance unexpended.....	101,362. 56
July 1, 1907, outstanding liabilities.....	1,578. 49
July 1, 1907, balance available.....	99,784. 07

## (E) TCHULA LAKE.

The work in Tchula Lake in progress June 30, 1906 (report for 1906, p. 1378), by a force of laborers under Overseer James H. Bobbs, on quarter boat *No. 2*, was completed September 21, 1906.

The following is a summary of the work performed:

Logs and stumps removed from channel.....	308
Shore snags cut.....	2,608
Stumps cut.....	645
Jams broken up and destroyed.....	2
Leaning trees felled and cut up.....	54,570
Trees girdled.....	380
Square yards of willows and brush cut.....	1,510

November 26 to December 10, 1906, the snag boat *Columbia* worked through the lake from head to mouth and back to head, starting drift in motion so far as practicable, and removed 311 snags from the channel.

*Money statement.*

July 1, 1906, balance unexpended.....	\$3,951. 92
Amount appropriated by river and harbor act approved March 2, 1907.....	4,000. 00
	7,951. 92
June 30, 1907, amount expended during fiscal year, for maintenance of improvement.....	3,661. 27
July 1, 1907, balance unexpended and available.....	4,290. 65

## APPROPRIATIONS.

By act of—	Yazoo River.	Tallahatchie and Cold-water rivers.	Big Sunflower River.	Tchula Lake.	Total.
March 8, 1873.....	\$40,000				\$40,000
March 3, 1875.....	12,000				12,000
August 14, 1876.....	15,000				15,000
June 18, 1878.....	25,000				25,000
March 3, 1879.....	15,000	\$13,000	\$20,000		48,000
June 14, 1880.....	12,000	13,000	8,000		33,000
March 3, 1881.....	6,000	3,000	4,000	\$3,000	16,000
August 2, 1882.....	8,000	3,000	5,000	2,500	18,500
July 5, 1884.....	10,000	3,000	5,000	1,500	19,500
August 5, 1886.....	15,000	3,500	5,000	2,000	25,500
August 11, 1888.....	32,000	5,000	5,000	3,000	45,000
September 19, 1890.....	25,000	5,000	5,000	3,000	38,000
July 13, 1892.....	20,000	5,000	5,000	3,000	33,000
August 18, 1894.....	20,000	4,000	5,000	3,000	32,000
June 8, 1896.....	20,000	4,000	5,000		29,000

## APPROPRIATIONS—continued.

By act of—	Yazoo River.	Tallahatchie and Cold-water rivers.	Big Sunflower River.	Tchula Lake.	Total.
March 3, 1899 .....	20,000	5,000	5,000	.....	30,000
June 13, 1902 (allotments) .....	21,000	10,000	29,000	4,000	55,000
March 3, 1906 (allotments) .....	85,000	10,000	6,000	4,000	105,000
March 2, 1907 .....	86,000	9,000	100,000	4,000	149,000
Total amount appropriated .....	437,000	95,500	208,000	33,600	768,500

Receipts from sales (Yazoo River) ..... \$110.46  
 Refundment of overpayment (Tallahatchie River) ..... .04

## CONTRACT IN FORCE.

Name of contractor: Ed J. Howard, Jeffersonville, Ind.  
 Character of work: Construction and delivery of steel snag boat.  
 Date of contract: April 2, 1906.  
 Date of approval: April 14, 1906.  
 Date of beginning work: April 26, 1906.  
 Date contract expires: Time limit waived.  
 Price of boat: \$42,483.

## COMMERCIAL STATISTICS.

## YAZOO RIVER.

*List of boats engaged in the trade during the fiscal year.*

Name.	Class.	Tonnage.	Length.	Breadth.	Depth.	Draft.		Between—	Round trips.	Passengers.
						Light.	Loaded.			
Henry Sheldon ..	Stern wheel.	220	159.0	29.0	3.9	1.5	3.5	Vicksburg and Greenwood.	25	415
Little Rufus .....	do .....	131	130.9	29.5	5.0	2.0	.....	Vicksburg and various points.	.....	.....
Addie T <sup>a</sup> .....	do .....	97	112.6	24.8	3.8	1.5	3.5	Vicksburg and Belzoni.	52	1,500
Marie J <sup>b</sup> .....	do .....	76	100.0	20.0	4.4	2.0	2.5	.....	.....	.....
Fountain City <sup>b</sup> ..	do .....	65	99.5	23.5	4.3	.....	.....	Vicksburg and Sata-tia.	42	12
Imogen .....	do .....	51	77.5	17.0	4.2	1.0	3.0	Greenwood and Belzoni.	40	.....
Edna <sup>b</sup> .....	do .....	50	70.0	21.4	3.0	2.2	2.8	Vicksburg and L'Argent.	.....	.....
Monarch <sup>a</sup> .....	Tug .....	43	71.2	14.3	3.4	.....	.....	Belzoni and various points.	.....	.....
Vanguard <sup>a</sup> .....	do .....	40	81.0	17.2	9.0	8.0	9.0	Vicksburg and various points.	.....	.....
Tempest .....	do .....	24	74.4	13.2	6.0	.....	.....	.....	.....	.....
Pride of Virginia <sup>a</sup>	Gasoline .....	14	50.5	12.0	2.5	1.5	.....	Yazoo City and L'Argent.	56	.....
J. B. Butts .....	do .....	15	84.0	15.0	2.8	1.2	.....	Yazoo City and Welch.	35	.....
Stella Guyon <sup>a</sup> ..	do .....	14	50.0	12.0	2.5	1.3	1.7	Yazoo City and L'Argent.	12	.....
C. R. Hull .....	do .....	9	65.0	12.8	2.0	1.3	.....	Vicksburg and L'Argent.	42	200
Lola M .....	do .....	8	45.0	13.5	3.8	.....	.....	Vicksburg and Woodburn.	5	.....
Queen <sup>a</sup> .....	do .....	.....	.....	.....	.....	1.5	2.0	Woodburn and Indianola.	2	12
.....	do .....	.....	.....	.....	.....	.....	.....	Vicksburg and Steele Bayou.	3	.....

<sup>a</sup> With one or more barges.

<sup>b</sup> Towboat.

*Summary of commerce reported.*

Articles.	Tons.	Value.	Articles.	Tons.	Value.
Cotton.....	3,793	\$1,087,780	Provisions.....	9,523	\$634,890
Cotton seed.....	6,208	99,335	Grain.....	7,975	249,280
Live stock.....	617	87,060	Miscellaneous.....	114,996	613,401
Lumber.....	2,700	82,400	Total.....	227,611	3,040,483
Staves.....	12,189	162,341			
Saw logs.....	69,610	174,026			

## TALLAHATCHIE AND COLDWATER RIVERS.

*List of boats engaged in the trade during the fiscal year.*

Name.	Class.	Tonnage.	Length.	Breadth.	Depth.	Draft.		Between—	Round trips.
						Light.	Loaded.		
Choctaw.....	Stern-wheel.	223	Feet. 127	Feet. 24	Feet. 4.0	Feet. 1.7	Feet. 3.5	Greenwood and Duncans..	87
Maggie.....	do.	50	85	19	3.5	1.9		Greenwood and Lone Star.	42
Admiral Schley...	Propeller....	3				3.5	3.5	Askew and Tibbs.....	60
								Rich and Neels Ferry.....	30

*Summary of commerce reported.*

Articles.	Tons.	Value.	Articles.	Tons.	Value.
Cotton.....	558	\$167,580	Provisions.....	1,125	\$75,000
Cotton seed.....	6,307	100,920	Grain.....	400	12,500
Live stock.....	50	3,000	Miscellaneous.....	428	29,696
Lumber.....	4,525	54,300	Total.....	29,358	488,845
Staves.....	625	7,500			
Saw logs.....	15,340	38,350			

## BIG SUNFLOWER RIVER.

*List of boats engaged in the trade during the fiscal year.*

Name.	Class.	Tonnage.	Length.	Breadth.	Depth.	Draft.		Between—	Round trips.	Passengers.
						Light.	Loaded.			
Osage <sup>a</sup> b.....	Stern-wheel.	98	Feet. 100	Feet. 19.8	Feet. 3.8	Feet. 2.0	Feet. 2.5	Vicksburg and Osceola		
Edna <sup>a</sup> b.....	do.	78	70	21.4	3.0	2.2	2.8	Vicksburg and Antho- ny's Ferry.	1	
Sam. A. Conner <sup>a</sup> b.	do.	63	98.5	16.0	2.6	1.8	2.2	Vicksburg and Osceola		
Peerless <sup>b</sup> .....	do.	50	100	20.0	4.0	1.2	2.5	Vicksburg and Wood- burn, and Burchs.	48	
Fawn <sup>a</sup> b.....	do.	46	95	18.5	3.3			Vicksburg and Osceola	4	
J. B. Butts.....	Gasoline	15	84	15	2.8	1.2		Yazoo City and Holly Bluff.		
Pride of Virginia <sup>b</sup> .	do.	14	50.5	12.0	2.5	1.5		do.		
Stella Guynn <sup>b</sup> .....	do.	14	50	12	2.5	1.3	1.7	do.		
C. R. Hull.....	do.	9	65	12.8	2.0	1.8		Vicksburg and Wood- burn.		
Kuroki.....	do.	2				1.5				

<sup>a</sup> Towboat.<sup>b</sup> With one or more barges.

## 1514 REPORT OF THE CHIEF OF ENGINEERS, U. S. ARMY.

## Summary of commerce reported.

Articles.	Tons.	Value.	Articles.	Tons.	Value.
Cotton.....	4,060	\$1,217,970	Provisions.....	2,900	\$193,340
Cotton seed.....	4,755	76,094	Grain.....	2,658	83,062
Live stock.....	198	11,880	Miscellaneous.....	2,864	226,218
Lumber.....	4,365	52,380	Total.....	145,160	2,211,860
Staves.....	3,073	50,198			
Saw logs.....	120,287	300,718			

## TCHULA LAKE.

## List of boats engaged in the trade during the fiscal year.

Name.	Class.	Tonnage.	Length.	Breadth.	Depth.	Draft.		Between—	Round trips.
						Light.	Loaded.		
J. B. Butts.....	Gasoline.....	15	84	15	2.3	1.2	.....	Yazoo City and Watsons.....	16
Stella Guynn.....	.....do.....	14	50	12	2.5	1.3	1.7	Yazoo City and Marcella.....	2

## Summary of commerce reported.

Articles.	Tons.	Value.
Cotton.....	411	\$123,300
Cotton seed.....	227	3,632
Lumber.....	56	672
Provisions.....	203	13,540
Grain.....	29	910
Total.....	926	142,054

## APPENDIX X.

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### IMPROVEMENT OF ARKANSAS RIVER AND OF CERTAIN RIVERS IN ARKANSAS AND MISSOURI.

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REPORT OF CAPT. WILLIAM D. CONNOR, CORPS OF ENGINEERS, OFFICER IN CHARGE, FOR THE FISCAL YEAR ENDING JUNE 30, 1907.

#### IMPROVEMENTS.

- |  |   |
|--|---|
| 1. Arkansas River, Arkansas.   | 5. Cache River, Arkansas.                           |
| 2. White River, Arkansas.  | 6. Black and Current rivers, Arkansas and Missouri. |
| 3. Upper White River, Arkansas.  | 7. St. Francis and L'Anguille rivers, Arkansas.     |
| 4. Operating and care of Locks and Dams Nos. 1 and 2, upper White River, Arkansas. |   |
- 

ENGINEER OFFICE, UNITED STATES ARMY,  
*Little Rock, Ark., July 8, 1907.*

GENERAL: I have the honor to forward herewith \* \* \* annual reports \* \* \* for the fiscal year ending June 30, 1907, for the works of improvement under my charge in Little Rock (Ark.) district. \* \* \*

Very respectfully, your obedient servant,

WM. D. CONNOR,  
*Captain, Corps of Engineers.*

Brig. Gen. A. MACKENZIE,  
*Chief of Engineers, U. S. A.*

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#### X I.

### IMPROVEMENT OF ARKANSAS RIVER, ARKANSAS.

#### OPERATIONS THIS FISCAL YEAR.

*Snagging operations.*—The snag boat *Quapaw* was worked in this river below Pine Bluff September 9, 1906, to November 5, 1906, both dates included, after which the boat was returned to White and Black rivers. The snag boat *Arkansas* was placed in commission early in April, 1907, and after running from Little Rock, Ark. (174 R.), to Carson Place (101 L.), with the board of engineers appointed by Special Order, No. 8, O. C. E., March 9, 1907, for examining this

river, began snagging operations at Pine Bluff April 23, 1907. This boat is working in the vicinity of Pine Bluff (107 R.) at the close of the year. The snag boat *C. B. Reese* left Little Rock (174 R.) on April 9, 1907, and began snagging operations at Bickers (56 R.) on the 12th. While working at Bankhead (85 L.) on April 30, 1907, the boat wrecked her capstan engine through the breaking of one of the piston rods. The engine was repaired at Pine Bluff, and the boat resumed operations on May 16, 1907. At the close of the year the boat is working in the vicinity of Pendleton (42 R.). The principal repairs made to the boats were: To the *Arkansas*, new roof, new paddle wheel, hull scraped and painted; to the *C. B. Reese*, new roof, new paddle wheel, new chimneys, new engine bed and piston rods for capstan engine, hull scraped and painted.

*Summary of snagging operations in Arkansas River, fiscal year 1907.*

Date.	Snag boat.	Work done between.	Distance.	Snags removed.	Trees cut.	Drifts broken.	Miles run.
1906.			<i>Miles.</i>				
September...	Quapaw .....	Poverty Point and Pine Bluff.	99	96	158	2	506
October.....	do .....	Poverty Point and Bickers...	48	147	725	3	234
November.....	do .....	Poverty Point and Sawmill Bend.	8	43	66	.....	21
1907.							
April .....	Arkansas .....	Pine Bluff and Jones Island..	59	57	.....	.....	163
Do .....	C. B. Reese .....	Bickers and Pitts.....	47	131	229	.....	281
May .....	Arkansas .....	Pine Bluff and Little Rock...	67	42	1, 023	.....	129
Do .....	C. B. Reese .....	Bickers and Pitts.....	47	.....	1, 512	.....	133
June.....	Arkansas .....	Pine Bluff and Little Rock...	67	192	2, 458	.....	138
Do .....	C. B. Reese .....	Post and Pine Bluff .....	71	197	1, 129	.....	145
Total .....		Poverty Point and Little Rock	166	904	7,895	5	1,750

*Hydraulic dredging.*—River and harbor act of June 12, 1902, made appropriation for operating hydraulic dredges in this river. The project for the expenditure of this fund is to make some experimental dredging with plant borrowed from the Mississippi River Commission before procuring plant for permanent use in this river. This spring the Mississippi River Commission loaned to this district the dredge *Gamma*, tenders *Nokomis* and *Mars*, 1,000 feet of ponton pipe; these to be returned to the Commission August 1, 1907. The dredge and auxiliaries entered this river April 10, and at the close of the year is working near Swan Lake (80 L.). Since the dredge has been here the stages of the river have been so fluctuating, low to-day and high to-morrow, that one can not yet make any definite statement of the probable benefit that will accrue to navigation interests through the operations of hydraulic dredges in the Arkansas River. The results obtained at Bickers (56) and Hannaberry (68) were entirely satisfactory, the cuts at both of these places remaining open and unchanged as to location, through and after the high stages of river that existed in May and in early part of June. The channel depths at Bickers on June 22, 1907 (Pine Bluff gage 9.9 feet and Helena gage 37.9 feet), and at Hannaberry on the preceding day (Pine Bluff gage 10.5 feet and Helena gage 37.1 feet) were 12½ feet. At Pleasants (73) the dredge cut was obliterated during the high stages referred to above, and the river instead of making the crossing from Pleasants to Dyes Point now goes down the Pleasant shore with a



channel depth of 7 feet on June 21, 1907. It is not probable that the dredge cut at Rob Roy (99) will remain open any length of time. The river here is changing and indications are that it will cease making the crossing from Wilkins to Rob Roy, but instead will follow down the Wilkins shore with the main channel under the fixed spans of the St. Louis-Southwestern railway bridge. Very likely this change will be completed during the freshet which is passing down the river at the close of this fiscal year and which will reach 21 feet on Pine Bluff gage July 4 or 5. In the operations of the dredge so far the sand moved has been very light and there has been no great difficulty in dredging against an 8-foot face. Drift and sunken logs have not given the trouble that was expected. As the bends of the river are shallow and the shoals long, the disposition of the waste from the dredge cuts is a serious problem. The plant used this year is too large for this river. When made up in a tow it is too long and unwieldy for the short bends. The draft of the ponton pipe as well as that of the dredge is too great. It is now thought to be advisable to repeat the experiment at some future time, using one of the lighter draught side-wheel dredges the next time. The work done by the *Gammas* was as follows:

*March 13–April 6.*—At West Memphis, Ark., preparing for work.

*April 7–10.*—Moving from West Memphis to Bickers (56) in Arkansas River.

*April 11–16.*—At Bickers Bend (56). Dug a channel 1,900 feet long and 100 feet wide. Left a channel 12 feet deep on the 16th. Pine Bluff gage 9.5 feet and Helena gage 31.9 feet, same date.

*April 17.*—Moved up to Hannaberry (68).

*April 18–19.*—At Hannaberry (68). Dug a channel 850 feet long and 125 feet wide. Left a channel 12 feet deep on the 19th. Pine Bluff gage 9.3 feet and Helena gage 31.7 feet, same date.

*April 20.*—Moved to Pleasants (73).

*April 21–25.*—At Pleasants (73). Dug a channel 1,025 feet long, 125 feet wide. Left a channel 8.5 feet deep on the 25th. Pine Bluff gage 7.7 feet and Helena gage 28.6 feet, same date.

*April 26–27.*—Moved up to Rob Roy (99).

*April 28–May 2.*—Working on Rob Roy bar (99). Had dug a channel 1,200 feet long and 75 feet wide to give a depth of 9 feet with Pine Bluff gage reading 9 feet, when work had to be suspended on account of high water.

*May 3–26.*—Lay at Rob Roy Landing, waiting for lower stage of water.

*May 27–June 3.*—Working on Rob Roy bar (99). The high water obliterated the channel previously made, and the dredge had dug another channel 1,800 feet long and 100 feet wide to give a depth of 9 feet with 9 feet on Pine Bluff gage, when work had to be suspended again on account of high water. This channel was on a range about 1,000 feet below the former one.

*June 4–7.*—Lay at Rob Roy Landing, waiting a lower stage of water.

*June 8–23.*—Working on Rob Roy bar (99). Dug a channel 2,200 feet long and 200 feet wide.

*June 24–29.*—Moved down to Swan Lake (80).

*June 30.*—Working on Swan Lake bar.

With the exception of about sixteen days in November, 1906, when there were only 2 to 2½ feet depths in the channels over the shoals between Swan Lake (80) and Little Rock (174), the river was at comparatively good boating stage all the year. Rob Roy bar (99), Wild Cat Crossing (136), and Wampoo Crossing (146) were the shoalest points between the mouth of the river and Little Rock.

The balance available July 1, 1907, will be expended in operating snag boats and dredges. This balance is sufficient to carry on this work to the close of the fiscal year ending June 30, 1909.

### *Money statement.*

July 1, 1906, balance unexpended.....	\$88,024. 23
Amount appropriated by river and harbor act approved March 2, 1907..	35,000. 00
Receipts from sales .....	23. 70
	123,047. 93
June 30, 1907, amount expended during fiscal year, for maintenance of improvement.....	26,296. 68
July 1, 1907, balance unexpended.....	96,751. 25
July 1, 1907, outstanding liabilities.....	9,529. 62
	87,222. 23
July 1, 1907, balance available.....	

### APPROPRIATIONS.

July 3, 1832: For improving the navigation of the Arkansas River, Arkansas, Indian Territory, and Kansas (less \$38 carried to sur- plus fund).....	\$14,962. 00
March 3, 1835: For improving the navigation of the Arkansas River .....	40,000. 00
March 3, 1837: For continuing the works.....	25,000. 00
July 7, 1838: For the improvement of the Arkansas River (less \$1,155.66 carried to the surplus fund).....	38,884. 34
From appropriations 1842-1844 (estimate).....	80,000. 00
August 30, 1852: For the improvement of the Arkansas River (less \$269.47 carried to surplus fund).....	39,730. 53
From appropriations 1866-1878 (disbursements reported by Colonel Suter).....	344,831. 59
April 14, 1876: For removing the bar at Fort Smith, Ark.....	10,000. 00
June 18, 1878: For removing the bar in the Arkansas River at Fort Smith.....	10,000. 00
March 3, 1879: For improvement of Arkansas River between Fort Smith, Ark., and Wichita, Kans.....	20,000. 00
For removing snags and bars, wrecks, and other obstruc- tions, and correcting and deepening the channel * * * on the Arkansas River.....	30,000. 00
June 14, 1880: For improvement of Arkansas River between Fort Smith, Ark., and Wichita, Kans.....	15,000. 00
For improving Arkansas River at Pine Bluff, Ark.....	25,000. 00
For removing snags, wrecks, and other obstructions * * * on the Arkansas River.....	35,000. 00
March 3, 1881: For improving Arkansas River between Fort Smith, Ark., and Wichita, Kans.....	24,000. 00
For improving Arkansas River at Pine Bluff, Ark.....	23,000. 00
For improving the Arkansas River.....	25,000. 00

<b>August 2, 1882:</b>	
Continuing improvement between Fort Smith, Ark., and Wichita, Kans.....	\$20,000.00
Continuing improvement at Pine Bluff, Ark.....	20,000.00
Continuing removal of snags, wrecks, * * * from the Arkansas River.....	35,000.00
<b>July 5, 1884:</b>	
For survey of the Arkansas River from Little Rock to the mouth.....	19,000.00
Improving Arkansas River at Pine Bluff, Ark.....	55,500.00
For removing obstructions in Arkansas River from its mouth to Wichita, Kans.....	36,000.00
For the protection of the harbor at Fort Smith, Ark.....	5,000.00
<b>August 5, 1886:</b>	
Continuing improvement, according to plan and recommendation in Appendix V 13, Executive Document No. 1, Forty-ninth Congress.....	75,000.00
For the removal of snags, wrecks, and other obstructions.....	19,875.00
<b>August 11, 1888:</b>	
Continuing improvement * * * between Wichita, Kans., and the navigable mouth of the Arkansas River.....	150,000.00
For removing obstructions.....	25,000.00
<b>September 19, 1890:</b>	
Continuing improvement from Wichita, Kans.....	180,000.00
For operating snag boats and removing obstructions.....	20,000.00
<b>July 13, 1892:</b>	
Improving Arkansas River, Arkansas and Indian Territory..	250,000.00
Removing obstructions and operating snag boats.....	20,000.00
<b>August 18, 1894:</b>	
Continuing improvement (\$10,000 may be used in removing obstructions and operating snag boats).....	250,000.00
Removing obstructions and operating snag boats.....	20,000.00
<b>June 3, 1896:</b>	
Continuing improvement (\$15,000 may be used in removing obstructions and operating snag boats).....	100,000.00
Removing obstructions and operating snag boats.....	20,000.00
<b>March 3, 1899:</b>	
Continuing improvement (\$50,000 may be used in removing snags, sand bars, and other obstructions).....	100,000.00
Removing obstructions and operating snag boats.....	20,000.00
<b>June 13, 1902: Continuing improvement and for maintenance, including the general improvement, and removing obstructions and operating snag boats.....</b>	
	110,000.00
<b>March 3, 1905:</b>	
For maintenance of improvement.....	35,000.00
For revetment work in vicinity of Red Fork, provided it is required in the interest of navigation.....	30,000.00
<b>March 2, 1907:</b>	
For maintenance of improvement.....	35,000.00
And the amounts heretofore appropriated to be expended in the vicinity of Red Fork levee or set apart for dredging are hereby made available for the maintenance of this improvement.	
<b>Total appropriations.....</b>	<b>2,450,783.46</b>
<b>September 15, 1900: Allotted from emergency river and harbor act</b>	
June 6, 1900, for repairs to Red Fork revetment.....	10,000.00
<b>June 7, 1904: Allotted from emergency river and harbor act approved April 28, 1904.....</b>	<b>20,000.00</b>
<b>February 18, 1905: Allotted from emergency river and harbor act approved April 28, 1904.....</b>	<b>* 504.41</b>
<b>Receipts from sales in fiscal year 1907.....</b>	<b>23.70</b>
<b>Total appropriations, allotments, and receipts from sales....</b>	<b>2,481,308.57</b>

\* \$1,000 less \$498.59 not used and returned to Treasury.

## EXPENDITURES.

For removing obstructions and operating snag boats.....	\$1, 138, 032. 20
For hydraulic dredging.....	8, 624. 05
For original construction of works for permanent improvement, including survey of river from Little Rock to the mouth.....	903, 311. 93
For maintenance of works for permanent improvement.....	334, 589. 14
Total expended to June 30, 1907.....	2, 384, 557. 32
Unexpended July 1, 1907.....	96, 751. 25
	2, 481, 308. 57

## COMMERCIAL STATISTICS.

No report was received of any commerce between Webbers Falls, Ind. T. and Muskogee, Ind. T., nor between Shoal Creek, Ark., and Fort Smith, Ark.

*List of vessels that navigated Arkansas River from May 31, 1906, to June 1, 1907.*

Name.	Net tonnage.	Draft loaded.		Between—	Round trips.	Passengers.
		Steamer.	Barge.			
		<i>Ft. in.</i>	<i>Ft. in.</i>			
Hazel Rice.....	101	3 6	5 6	Helena and South Bend.....	30	
				Little Rock and Rectors.....	4	
Henry Sheldon....	220	3 6		Little Rock and Eagles.....	7	
				Little Rock and Lasters.....	1	7, 464
				Little Rock and Cardens Bottoms.....	2	
J. M. Linder.....	73	3 0	4 6	Excursions.....	15	
Pet (gasoline).....	10	1 4	1 4	Greenville and Red Fork.....	3	
A. D. Allen.....	86	3 5		Little Rock and Fieldston.....	10	
W. M. Gladden.....	27	2 6		Little Rock and Pine Bluff.....	44	2, 240
				Hawksston and Lewisburg.....	4	
Mary C. Lucas.....	52	3 6	3 0	Fort Smith and Webbers Falls.....	42	108
Marie J.....	76	3 0	5 0	Little Rock and Shoal Creek.....	6	9
Wash Honshall.....	134	3 6	6 0	Vicksburg and Manards.....	6	
Birmingham.....	187	5 0	5 0	Joppa and South Bend.....	1	
Victor.....	100	3 0	5 0	Helena and Pendleton.....	22	
Eagle.....	188	4 6	5 0	do.....	8	
J. N. Harbin.....	142	3 0		Mouth and South Bend.....	4	
Lucille Nowland....	298	5 0		Memphis and Pine Bluff.....	89	1, 840
				Memphis and Pine Bluff.....	6	
S. S. Brown.....	405	5 0		Memphis and Little Rock.....	9	762
				Memphis and South Bend.....	1	
David Neal (gas) ..	15	1 6	2 0	Memphis and Pine Bluff.....	1	268
Dolphin No. 3.....	356	4 6	5 0	Memphis and Little Rock.....	1	
J. C. Ailee.....	87	3 0	5 0	Big Island and Garland Lake.....	75	
Joy Patton.....	63	4 6	5 0	Barging timber out of lower river.....	4	
Climax.....	58	3 0		do.....	2	
H. C. Brockman.....	75	2 6		do.....	4	
Roann.....	25	2 0		Towing rafts out of lower river.....	38	
Chicago.....	52	3 3		do.....	42	
				do.....	25	
				do.....	30	

*Classification of commerce reported, year ending May 31, 1907.*

Articles.	Tons.	Articles.	Tons.
Cotton.....	7, 613	Staves and bolts.....	4, 833
Cotton seed.....	4, 280	Shingles.....	1, 743
Grain.....	3, 102	Miscellaneous freights.....	7, 444
Live stock.....	704		
Lumber.....	15, 659	Total tonnage reported.....	104, 593
Provisions.....	2, 987		
Saw Logs.....	56, 223	Estimated value.....	\$2, 192, 531

## X 2.

## IMPROVEMENT OF WHITE RIVER, ARKANSAS.

## OPERATIONS THIS FISCAL YEAR.

From the beginning of the year to the time the appropriation made by act of March 2, 1907, became available, operations were necessarily confined to care of property, the only exception being that when the *Quapaw* returned to Newport from the Arkansas River in November, 1906, it removed 36 snags from the channel, cut 57 trees on caving banks and broke up one drift between Poverty Point (8 R, and Newport (258 L). In March, 1907, the *Quapaw* was overhauled and fitted out for work. During the month of April it worked over the river between Shaddens (229 R) and Batesville (301 L), and during June it worked over the river between Grand Glaize (242 R) and Batesville (301 L). During the year 207 snags were removed from the channel, 2 drifts broken, 5,352 trees cut, and 785 miles run by the boat.

Of the balance available July 1, 1907, \$7,500 are being withheld pending an examination of a purported threatened cut-off near the town of Devall Bluff (125 R). The remainder of this balance will be expended in snagging operations. The amount estimated as being needed during the fiscal year ending June 30, 1909, is for maintenance of channel by snagging operations.

*Money statement.*

July 1, 1906, balance unexpended.....	\$2, 882. 42
Amount appropriated by river and harbor act approved March 2, 1907.....	30, 000. 00
Receipts from sales.....	12. 10
	<hr/>
	32, 894. 52
June 30, 1907, amount expended during fiscal year, for maintenance of improvement.....	3, 953. 77
	<hr/>
July 1, 1907, balance unexpended.....	28, 940. 75
July 1, 1907, outstanding liabilities.....	910. 91
	<hr/>
July 1, 1907, balance available.....	28, 029. 84
	<hr/>
{ Amount that can be profitably expended in fiscal year ending June 30, 1909, for maintenance of improvement, in addition to the balance unexpended July 1, 1907.....	6, 600. 00
{ Submitted in compliance with requirements of sundry civil act of June 4, 1897, and of section 7 of the river and harbor act of 1890.	

## APPROPRIATIONS.

Appropriations for this river have been partly for limited reaches, partly for the whole river, and partly for this river in combination with others.

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The appropriations for this river separately and for reaches of it are as follows:

June 23, 1874 .....	\$50,000.00	June 13, 1902 .....	\$22,000.00
August 14, 1876 .....	10,000.00	May 31, 1904, allotted from	
March 3, 1879 .....	10,000.00	appropriation for mainte-	
June 14, 1880 .....	20,000.00	nance of river and har-	
June 14, 1880 .....	5,000.00	bor improvement, act of	
March 3, 1881 .....	8,000.00	June 13, 1902 .....	7,100.00
August 2, 1882 .....	6,000.00	March 3, 1905 .....	15,000.00
August 2, 1882 .....	4,000.00	March 2, 1907 .....	30,000.00
July 5, 1884 .....	35,000.00		
August 5, 1886 .....	18,000.00	Total appropriations	
August 11, 1888 .....	25,000.00	and allotments .....	458,915.00
September 19, 1890 .....	30,000.00	Receipts from sales this	
July 13, 1892 .....	75,000.00	fiscal year .....	12.10
August 18, 1894 .....	52,000.00		
June 3, 1896 .....	22,000.00	Total .....	458,927.10
March 3, 1899 .....	14,815.00		

## COMMERCIAL STATISTICS.

The river was at a good boating stage all the year. No report was received of the business done by the steamboats *Mildred* and *Hosmer*, which were engaged in barging timber and ties, nor of the business done by several gasoline-power boats, engaged in barging mussel shells.

List of vessels that reported navigating White River, Arkansas, from May 31, 1906, to June 1, 1907.

Name.	Net tonnage.	Draft loaded.		Between—	Round trips.	Passengers.
		Steamers.	Barges.			
		<i>Ft. in.</i>	<i>Ft. in.</i>			
Liberty .....	68	3 6		St. Louis and Batesville .....	1	82
Miriam .....	65	3 0	3 0	Newport and Black Island .....	1	
Charley V a .....	27	3 0		Newport and Miles Mill .....	1	
				Rosedale and Indian Bay .....	40	
				Jacksonport and Newport .....	33	
Start .....	43	2 6	5 0	Newport and Des Arc .....	16	
				Des Arc and Clarendon .....	1	
				Des Arc and Rosedale .....	1	
				Des Arc and timber camps .....	33	
G. W. Huff .....	66	3 4	4 0	Jacksonport and Augusta .....	21	
Alda .....	73	3 6	5 0	Clarendon and log yards .....	50	
Geo. Pope .....	97	3 0	5 0	Newport and Jacksonport .....	36	25
Minnehaha .....	46	3 0	5 0	Jacksonport and Little Red River .....	26	50
Rock City .....	64	2 2	4 6	DeVall Bluff and Little Red River .....	40	
Peerless a .....	21	1 8	2 6	Clarendon and Rosedale .....	15	
C. E. Taylor .....	79	3 0	4 6	Newport and Black River .....	4	
Chicago .....	52	3 0		Towing rafts .....		
Maude Kilgore .....	82	4 0	6 0	Newport and St. Charles .....	40	

a Gasoline-power boats. All other steamboats.

Classification of commerce reported year ending May 31, 1907.

Articles.	Tons.	Articles.	Tons.
Cotton .....	1,309	Piling .....	7,000
Cotton seed .....	180	Miscellaneous freights .....	15,842
Lumber .....	13,685		
Staves and bolts .....	4,000	Total tonnage reported .....	127,812
Railway ties .....	10,952		
Saw logs .....	74,894	Estimated value .....	\$830,650

## X 3.

## IMPROVEMENT OF UPPER WHITE RIVER, ARKANSAS.

## OPERATIONS THIS FISCAL YEAR.

All operations under this head this year were on the construction of Lock and Dam No. 3. At the close of last fiscal year the lock walls, together with back filling and paving behind the land wall and the upper guide cribs, had been completed, the filling valves set, and excavation for the abutment begun. During this year the abutment, the 150-foot protection crib below it, together with back fill and paving, and 160 feet of bank protection below the crib have been completed; 40 linear feet of the dam next to the abutment and part of the corner crib in the angle of the dam and abutment have been built up to the elevation of the apron; the levee across the swale behind the abutment was about three-fourths completed; about 85 per cent of the timber needed for the main dam was received, sorted, and stacked; framing of the lock gates was begun May 29, 1907, and excavation for the main dam was begun on June 20, 1907. All floating plant was overhauled and repaired during the high-water season.

The balance available July 1, 1907, will be expended in completing Lock and Dam No. 3.

*Money statement.*

July 1, 1906, balance unexpended.....	\$55,890.22
Amount appropriated by river and harbor act approved March 2, 1907.....	73,500.00
Receipts from sales.....	1.84
	<hr/>
June 30, 1907, amount expended during fiscal year, for works of improvement.....	129,392.06
	<hr/>
	\$48,503.08
July 1, 1907, balance unexpended.....	80,888.98
July 1, 1907, outstanding liabilities.....	16,599.65
	<hr/>
July 1, 1907, balance available.....	64,289.33
	<hr/>
July 1, 1907, amount covered by uncompleted contracts.....	12,366.65

## APPROPRIATIONS.

March 3, 1899.....	\$160,000.00
June 6, 1900.....	150,000.00
June 13, 1902.....	270,000.00
March 3, 1905.....	160,000.00
March 2, 1907.....	73,500.00
Receipts from sales.....	1.84
	<hr/>
Total.....	813,501.84

\* Lock No. 2, \$943.26; Lock No. 3, \$47,559.82.

## CONTRACTS.

Name and address of contractor.	Nature of contract.	Rate.	Contract approved.	Work began.	Expiration of contract.
C. J. Carter Lumber Co., Kansas City, Mo.	Rough oak, gum, pine or ash lumber:				
	25,000 feet B. M. ...	\$19.00	(a)	April 20, 1907.	May 31, 1907.
	26,667 feet B. M. ...	18.50			
	62,500 feet B. M. ...	19.00			
	70,000 feet B. M. ...	21.00			
	80,000 feet B. M. ...	20.00			
Albright and Ramsey, Batesville, Ark.	15,167 feet B. M. ...	22.00			
	14,000 cubic yards riprap stone.	83 cents a cubic yard.	(a)	June 11, 1907.	Oct. 15, 1907.

\* Emergency; no approval.

## COMMERCIAL STATISTICS YEAR ENDING MAY 31, 1907.

The only boats reporting navigating this river this year were the gasoline boat *Angeline*, which was engaged in barging wheel stock and cooperage stuffs to Batesville, and the steamboat *Liberty*. The tonnage reported was 12,532 tons of rafted railway ties, logs, lumber, and cedar, having an estimated value of \$49,700, and 1,702 tons of barged wheel stock and cooperage stuffs and miscellaneous freights, having an estimated value of \$35,456. Parties at Batesville, Ark., have purchased a steamboat and intend operating a barge line between that place and points above.

## X 4.

## OPERATING AND CARE OF LOCKS AND DAMS NOS. 1 AND 2, UPPER WHITE RIVER, ARKANSAS.

These locks and dams were built from funds derived from appropriations for improving Upper White River, Arkansas. Lock No. 1, 1 mile below Batesville, Ark., was placed under the indefinite appropriation for operating and care of canals, etc., January 16, 1904; Lock No. 2, 8 miles above Batesville, Ark., was placed under that appropriation February 16, 1905.

## OPERATIONS THIS FISCAL YEAR.

*Lock and Dam No. 1.*—Operations were in general confined to the ordinary operation and maintenance of the lock and the care of the grounds and buildings. In September, 1906, 116 cubic yards of derrick stone were placed on the downstream side of the dam just below the apron cribs immediately downstream from the old abutment. Also, during this month, six brush and stone high-water sills (158 cubic yards of one-man stone and 20 cords of brush) were built in the swale at the foot of Ramsey Mountain to prevent erosion there during



high water. These are supplemental to those built in December, 1903. In October, 1906, the bank revetment below the abutment was extended by the addition of 105 linear feet of subaqueous mattress, 40 feet wide. The bank paving was extended 30 feet.

*Lock and Dam No. 2.*—At the beginning of this fiscal year repair of damages done by the high water of March, 1906, were in progress. These repairs were completed during the months of July, August, and September, the materials used this fiscal year being as follows: 605 cubic yards of derrick stone, used in filling scoured area below the dam; 199 cubic yards of gravel, used in stopping leak under abutment; 155 cubic yards of one-man stone, used in backing to lower wing wall of lock; 35 cubic yards of stone, used in extending paving along lock wall; 91 cubic yards of one-man stone, used in completing the 140-foot revetment below the lock; 80 cubic yards of riprap and 43 cubic yards of gravel, used in rebacking the main dam near the lock wall. After these repairs had been completed no work beyond ordinary operation and care was needed until the high water of May, 1907, a high water which reached a height of 8.2 feet over the lock walls, at which time there was still a difference of 3.7 feet between the pool levels. This water again damaged the works. Practically all the filling behind the land wall was washed out and the upper wing wall was flanked. About 2,000 cubic yards of the eroded material was deposited in the lock chamber. Considerable and serious scour took place below the dam, but because of continual comparative high stages of river it has not been possible to make a satisfactory examination of conditions here. Special project covering the repair of the damages in the immediate vicinity of the lock was approved May 20, 1907. This project contemplates extending the upper wing wall of the lock, refilling the scoured area behind the land wall and upper land crib, building a levee to prevent the high water flowing across the river front of the lock yard, and in repaving behind the land wall and along the river slope of the levee, the paving to be flushed with 1 to 4 cement mortar. Working under this project to the close of the fiscal year, the following work has been done: Upper wing wall of lock extended 30 feet; scoured area behind land wall of lock and behind land cribs refilled; the levee about one-third completed, and 577 square yards of paving laid. All floating plant was kept in repair.

Dam No. 2 is too short by about 250 feet, and at present it appears that at some future time it will be necessary to either lengthen the dam or cut down its height and fit it with movable weirs to increase the discharge area and thus reduce the difference in elevations between the pools during high stages of river. Ever since the dam has been built every high water above an ordinary freshet has caused much damage to the works, even to the extent of threatening their destruction. The cost of these continual repairs will soon exceed the cost of remodeling the works to accommodate the volume of flow of the river. For the purpose of showing the difference in pool heights at Dam No. 1 and at Dam No. 2 for the same volume of flow in the river, a table showing stages of the river at the two dams during this fiscal year is incorporated herein.

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## Comparison of river stages at Locks Nos. 1 and 2.

[Stages are referred to the crest of the dam. In both locks the upper miter sill is 5 feet below, the lower miter sill 19 feet below, and the top of the lock walls 10 feet above the crest of the dam.]

### Highest stages.

Date.	Dam No. 1.			Dam No. 2.		
	Upper pool.	Lower pool.	Fallover dam.	Upper pool.	Lower pool.	Fallover dam.
<b>1906.</b>						
July 24.....	<i>Feet.</i> + 2.7	<i>Feet.</i> - 7.1	<i>Feet.</i> 9.8	<i>Feet.</i> + 2.9	<i>Feet.</i> - 8.1	<i>Feet.</i> 11.0
August 14.....	+ 5.2	- 2.2	7.4	+ 5.3	- 4.3	9.6
September 30.....	+ 7.3	+ 2.1	5.2	+ 7.5	- 0.2	7.7
October 1.....	+ 7.6	+ 3.1	4.7	+ 7.6	+ 0.1	7.5
November 22.....	+ 4.1	- 4.5	8.6	+ 3.9	- 6.3	10.2
December 16.....	+ 7.6	+ 2.8	4.8	+ 7.4	- 0.1	7.5
<b>1907.</b>						
January 11.....	+10.1	+ 7.3	2.8	+ 9.8	+ 3.7	6.1
February 28.....	+ 3.8	- 5.3	9.1	+ 3.8	- 6.7	10.5
March 15.....	+ 5.1	- 2.7	7.8	+ 5.0	- 4.6	9.6
April 30.....	+ 6.6	+ 0.4	6.2	+ 6.3	- 2.3	8.6
May 8.....	+20.0	+19.5	0.5	+18.2	+14.5	3.7
June 3.....	+12.3	+10.5	1.8	+12.1	+ 7.0	5.1

### Lowest stages.

Date.	Dam No. 1.			Dam No. 2.		
	Upper pool.	Lower pool.	Fallover dam.	Upper pool.	Lower pool.	Fallover dam.
<b>1906.</b>						
July 11.....	<i>Feet.</i> +1.0	<i>Feet.</i> -10.7	<i>Feet.</i> 11.7	<i>Feet.</i> +1.1	<i>Feet.</i> - 11.3	<i>Feet.</i> 12.4
August 8.....	+0.8	-11.2	12.0	+1.0	-11.7	12.7
September 25.....	+1.1	-10.7	11.8	+1.1	-11.4	12.5
October 31.....	+1.2	-10.7	11.9	+1.1	-11.4	12.5
November 16.....	+0.9	-11.4	12.3	+0.9	-11.8	12.7
December 2.....	+2.0	- 8.9	10.9	+2.1	- 9.6	11.7
<b>1907.</b>						
January 31.....	+3.0	- 6.8	9.8	+2.9	- 8.1	11.0
February 23.....	+1.6	- 9.7	11.3	+1.6	-10.5	12.1
March 31.....	+1.9	- 8.2	10.1	+2.0	- 9.8	11.8
April 3.....	+1.9	- 9.0	10.9	+1.9	- 9.9	11.8
May 31.....	+2.2	- 8.2	10.4	+2.3	- 8.9	11.2
June 25.....	+1.6	- 9.5	11.1	+1.5	-10.0	11.5

### ALLOTMENTS.

December 26, 1903, Lock and Dam No. 1.....	\$600. 00
June 22, 1904, Lock and Dam No. 1.....	3, 701. 00
February 10, 1905, Lock and Dam No. 2.....	1, 095. 00
June 28, 1905, Lock and Dam No. 2.....	4, 850. 00
July 7, 1905, Lock and Dam No. 2.....	30, 000. 00
July 13, 1905, Locks and Dams Nos. 1 and 2.....	8, 094. 00
July 13, 1906, Locks and Dams Nos. 1 and 2.....	23, 479. 00
May 29, 1907, Lock and Dam No. 2.....	3, 200. 00
Total allotments.....	75, 019. 00
Refundments of overpayments.....	5. 00
Total.....	75, 024. 00
Expended to June 30, 1907.....	\$71, 601. 89
Outstanding liabilities July 1, 1907.....	3, 422. 11
	75, 024. 00

*Summary of expenditures during the fiscal year ending June 30, 1907.*

Nature.	Lock and Dam No. 1.	Lock and Dam No. 2.	Total.
Services .....	\$7,253.83	\$9,442.62	\$16,696.45
Materials .....	3,268.25	3,254.70	6,522.95
Supplies .....	504.96	2,562.22	3,057.18
Property .....	112.46	80.16	192.62
General expense .....	177.02	186.01	363.03
Total expenditure this year .....	11,316.52	15,525.71	26,842.23
Expended in previous years .....	6,653.37	38,106.29	44,759.66
Total to June 30, 1907 .....	17,969.89	53,632.00	71,601.89

## CONTRACTS.

*Pine lumber.*

Name and address of contractor.	Nature of contract.	Rate per thousand.	Contract approved.	Work began.	Expiration of contract.
Urania Lumber Co. (Limited), Alexandria, La. ....	<i>Feet B. M.</i>				
	1,326	\$29.50	(a)	Sept. 18, 1906	<sup>b</sup> Nov. 7, 1906
	635	28.50			
	579	27.50			
	13,872	27.00			
	3,648	25.50			
	42,774	25.00			
	1,440	24.50			
	464	24.00			
	5,740	23.00			
	4,216	22.00			
	4,544	20.00			
	1,440	19.00			
	19,521	18.00			

\* Emergency; no approval.

<sup>b</sup> Extended for reasonable period.

## COMMERCIAL STATISTICS, YEAR ENDING MAY 31, 1907.

	Lock and Dam No. 1.	Lock and Dam No. 2.
Lockages.....	191	263
Steam and gasoline boats.....	3	86
Houseboats and other unregistered craft.....	96	82
Railway ties and walnut logs (rafted).....	6,778	7,749
Wheel stock and cooper stuffs (barged).....		1,662
Miscellaneous freights.....	20	20
Estimated value of freights.....	\$58,300	\$40,940

## X 5.

## IMPROVEMENT OF CACHE RIVER, ARKANSAS.

## OPERATIONS THIS FISCAL YEAR.

Nothing done, the snagging season having passed before the appropriation made by act of March 2, 1907, became available.

The balance available July 1, 1907, will be expended in working a chopping party over the river below James Ferry (79 miles above the

mouth). The amount estimated as being needed during the fiscal year ending June 30, 1909, is for maintenance of channel below James Ferry by snagging operations.

*Money statement.*

Amount appropriated by river and harbor act approved March 2, 1907.....	\$2, 000. 00
July 1, 1907, balance unexpended.....	2, 000. 00
<hr/>	
{ Amount that can be profitably expended in fiscal year ending June 30, 1909, for maintenance of improvement, in addition to the balance unexpended July 1, 1907.....	3, 000. 00
{ Submitted in compliance with requirements of sundry civil act of June 4, 1897, and of section 7 of the river and harbor act of 1899.	

APPROPRIATIONS AND ALLOTMENTS.

August 18, 1888, mouth to Riverside.....	\$7. 000
July 13, 1892, mouth to Riverside.....	2, 000
August 17, 1894, allotted from White River.....	2, 000
June 3, 1896, allotted from White River.....	2, 000
March 3, 1899, mouth to James Ferry.....	1, 000
June 13, 1902, mouth to James Ferry.....	2, 000
March 3, 1905, mouth to James Ferry.....	2, 000
March 2, 1907, mouth to James Ferry.....	2, 000
Total.....	20, 000

COMMERCIAL STATISTICS.

The commerce reported for the year ending May 31, 1907, consisted of 9,750 tons of saw logs and 3,300 tons of railway ties, all of which were rafted and floated with the current.

X 6.

IMPROVEMENT OF BLACK AND CURRENT RIVERS, ARKANSAS AND MISSOURI.

These works were consolidated by river and harbor act of March 3, 1905, prior to which they had been provided for under separate appropriation titles.

OPERATIONS THIS FISCAL YEAR.

(A) BLACK RIVER.

The snag boat *Quapaw* worked over the river below Black Rock (80) during the latter half of November, 1906. In May, 1907, this boat worked over the river below the mouth of Current River (116). In both instances the river was at too high a stage to do much channel work, therefore the work was confined to cutting overhanging timber.

The snag boat *Riverside* (hand propelled) came into this river from Current River July 6, 1906, and worked upstream toward Poplar Bluff (239) to Hogg Place (232), where a 15-foot rise was met on November 18 and 19, 1906. The boat was cordelled to Poplar Bluff (239) and laid up for the winter. It was placed in commission again on June 11, 1907, and at the close of the year is working in the vicinity of the foot of Big Island (220).

*Summary of work done by snag boats Quapaw and Riverside in Black River.*

Boat.	Work done between—	Distance.	Snags removed.	Trees cut.	Drifts broken.	Miles run.
		<i>Miles.</i>				
Quapaw .....	Mouth of Black and mouth of Current River.	116	25	3,222	2	397
Riverside.....	Mouth of Current River and Poplar Bluff .....	123	1,045	1,228	7	198
Total ..	Mouth of Black River and Poplar Bluff .....	239	1,070	4,450	9	595

(B) CURRENT RIVER.

The only active operations on this stream this year were those of working the snag boat *Riverside* (hand propelled) from Greene Place (12.6) to the mouth of the river during the first five days in July, 1906. By these operations 30 snags were removed from the channel and 77 trees cut from caving banks. The expenditures this year have been in payments of liabilities outstanding at the close of last fiscal year, in payment for caring for plant, and in payment of apportioned expenses of repairing and refitting the *Quapaw* and *Riverside* for active work during the coming season.

*Money statements.*

BLACK RIVER.

July 1, 1906, balance unexpended.....	\$5,926.08
Amount appropriated by river and harbor act approved March 2, 1907.....	13,000.00
Receipts from sales.....	7.00
	18,933.08
June 30, 1907, amount expended during fiscal year, for maintenance of improvement.....	6,589.93
July 1, 1907, balance unexpended.....	12,343.15
July 1, 1907, outstanding liabilities.....	688.16
July 1, 1907, balance available.....	11,654.99

CURRENT RIVER.

July 1, 1906, balance unexpended.....	\$1,314.16
Amount appropriated by river and harbor act approved March 2, 1907.....	5,000.00
	6,314.16
June 30, 1907, amount expended during fiscal year, for maintenance of improvement.....	1,285.01
July 1, 1907, balance unexpended.....	5,029.15
July 1, 1907, outstanding liabilities.....	4.00
July 1, 1907, balance available.....	5,025.15

## CONSOLIDATED.

{ Amount that can be profitably expended in fiscal year ending June 30, 1909, for maintenance of improvement, in addition to the balance unexpended July 1, 1907----- \$1,000.00  
 Submitted in compliance with requirements of sundry civil act of June 4, 1897, and of section 7 of the river and harbor act of 1899.

## APPROPRIATIONS.

Appropriations for Black River have been made separately under the heads of "Improving Black River, Missouri," "Improving Black River, Arkansas," and "Improving Black River, Arkansas and Missouri." This river is understood not to have been included in the snagging operations under the early appropriations for snagging in western rivers. The appropriations for it and for Current River are:

Date of act.	Black River.	Current River.
June 2, 1872.....		\$5,000.00
June 14, 1880.....	\$15,000.00	
March 3, 1881.....	6,000.00	2,000.00
August 2, 1882.....	10,000.00	
July 5, 1884.....	20,000.00	
August 5, 1886.....	5,000.00	
August 11, 1888.....	12,000.00	
September 19, 1890.....	12,000.00	
July 13, 1892.....	5,000.00	
August 18, 1894.....	9,500.00	8,000.00
June 3, 1896.....	8,000.00	2,000.00
March 3, 1899.....	8,000.00	5,000.00
June 13, 1902.....	21,700.00	6,900.00
May 31, 1904, allotted from maintenance appropriation, act of June 13, 1902.....	8,580.50	2,985.00
March 3, 1905 (apportioned).....	13,000.00	5,000.00
March 2, 1907 (apportioned).....	13,000.00	5,000.00
Total appropriations.....	166,730.50	41,835.00
Receipts from sales this fiscal year.....	7.00	
Total receipts.....	166,737.50	41,835.00

\* \$8,500 less \$319.50 not used and returned to the Treasury.

## COMMERCIAL STATISTICS.

Both rivers were at good boating stage all the year.

List of vessels that navigated Black River from May 31, 1906, to June 1, 1907.

Name.	Net tonnage.	Draft loaded.		Between.	Round trips.	Passengers.
		Steamer.	Barges.			
		<i>Ft. in.</i>	<i>Ft. in.</i>			
Miriam.....	65	3 0		Newport and Gibbon Mill.....	1	
Welcome.....	45	2 2	2 6	Pocahontas and Strawberry.....	25	
Starr.....	43	2 6	5 0	Pocahontas and Downey.....	75	
G. W. Huff.....	66	3 4	4 0	Jacksonport and Clover Bend.....	4	
Geo. Pope.....	97	3 0	5 0	Pocahontas and sundry points.....	72	212
Minnehaha.....	46	3 0	5 0	Jacksonport and Black Rock.....	36	25
				do.....	25	50
Roy.....	49	2 4	3 6	Poplar Bluff and Old River.....	149	
				Poplar Bluff and Corning.....	74	
C. E. Taylor.....	79	3 0	4 6	Black Rock and log yards.....	21	
Hickory (gasoline). line).	5	2 0	2 0	Current River and Newport.....	4	
				Pocahontas and Little Black River.....	75	
				Brookings and Corning.....	10	

*List of vessels that navigated Current River from May 31, 1906, to June 1, 1907.*

Name.	Net tonnage.	Draft loaded.		Between.	Round trips.	Passengers.
		Steamer.	Barges.			
		<i>Ft. tn.</i>	<i>Ft. tn.</i>			
Welcome.....	45	2 2	2 6	Downey and Pocahontas.....	75	.....
G. W. Huff.....	66	3 4	4 0	Pocahontas and Little Black River.....	3	.....
C. E. Taylor.....	79	3 0	4 6	.....do.....	75	.....

*Classification of commerce reported, year ending May 31, 1907.*

Articles.	Black River.	Current River.	Articles.	Black River.	Current River.
	<i>Tons.</i>	<i>Tons.</i>		<i>Tons.</i>	<i>Tons.</i>
Cotton.....	624	400	Miscellaneous freights.....	1,056	.....
Cotton seed.....	330	100			
Lumber.....	27,685	.....	Total reported.....	107,914	48,486
Saw logs.....	46,828	14,436			
Staves and bolts.....	25,691	25,610	Estimated value.....	\$592,968	\$226,655
Railway ties.....	5,701	7,940			

## X 7.

### IMPROVEMENT OF ST. FRANCIS AND L'ANGUILLE RIVERS, ARKANSAS.

#### OPERATIONS THIS FISCAL YEAR.

Other than to care for property and make preliminary arrangements for beginning active operations in July, 1907, nothing was done during this fiscal year, the appropriation of March 2, 1907, not becoming available until the snagging season had passed.

The balance available July 1, 1907, will be expended in snagging operations below the mouth of Tyronza (118) and in caring for plant during high-water seasons. The amount estimated as being needed during the fiscal year ending June 30, 1909, is for snagging operations.

#### *Money statement.*

July 1, 1906, balance unexpended.....	\$868.71
Amount appropriated by river and harbor act approved March 2, 1907.....	12,000.00
	12,868.71
June 30, 1907, amount expended during fiscal year, for maintenance of improvement.....	716.45
July 1, 1907, balance unexpended.....	12,152.26
July 1, 1907, outstanding liabilities.....	275.21
July 1, 1907, balance available.....	11,877.05
{ Amount that can be profitably expended in fiscal year ending June 30, 1909, for maintenance of improvement, in addition to the balance unexpended July 1, 1907.....	
Submitted in compliance with requirements of sundry civil act of June 4, 1897, and of section 7 of the river and harbor act of 1899.	
	2,500.00

## APPROPRIATIONS.

The earlier examinations and the earlier operations were made under appropriations for these in conjunction with other rivers. Of the expenditures under those appropriations this office has no record.

The separate appropriations are as follows:

March 3, 1871, St. Francis River, Arkansas.....	\$10,000.00
June 14, 1880, St. Francis River, Arkansas.....	5,000.00
July 5, 1884, St. Francis River, Arkansas.....	12,000.00
August 5, 1886, St. Francis River, Arkansas.....	8,000.00
August 11, 1888, St. Francis River, Arkansas.....	4,000.00
September 19, 1890, St. Francis River, Arkansas.....	4,000.00
August 18, 1894, St. Francis River, Arkansas (part).....	8,000.00
June 3, 1896, St. Francis River, Arkansas.....	8,000.00
March 3, 1899, St. Francis River, Arkansas.....	8,000.00
June 18, 1878, L'Anguille River, Arkansas.....	10,000.00
March 3, 1879, L'Anguille River, Arkansas.....	5,000.00
June 14, 1880, L'Anguille River, Arkansas.....	2,000.00
June 13, 1902, St. Francis and L'Anguille rivers, Arkansas.....	9,000.00
May 31, 1904, allotted from appropriation for maintenance of river and harbor improvement, act June 13, 1902 (less \$62.81 returned).....	4,237.19
March 3, 1905.....	6,000.00
March 2, 1907.....	12,000.00
Total appropriations for St. Francis and L'Anguille rivers.....	115,237.19
Expended to June 30, 1907:	
Old project.....	\$84,000.00
New project.....	19,084.93
	103,084.93
Unexpended July 1, 1907.....	12,152.26

## COMMERCIAL STATISTICS.

Below the town of Madison the river was at comparatively good boating stage all the year. Above the town of Madison the river was too shoal for profitable navigation during July, August, and a part of September. Commerce in the Sunken Lands above the town of Marked Tree is handled mainly by small gasoline-power boats towing small barges of 10 to 15 tons capacity. No report was received from any of these boats, of which there are several in this section of the river. One individual interested in the commerce in the Sunken Lands estimates that it will be about 12,000 tons this year.

*List of vessels reporting having navigated St. Francis River, Arkansas, between May 31, 1906, and June 1, 1907.*

Name.	Net tonnage.	Draft loaded.				Between—	Round trips.	Passengers.
		Steamer.		Barges.				
		Ft.	in.	Ft.	in.			
Hazel Rice.....	101	3	6	5	6	Marianna and Helena .....	10	.....
						Memphis and Togo.....	1	.....
J. M. Linder .....	78	3	0	4	2	Memphis and Burnt Cane.....	1	.....
						Memphis and Double Bar .....	1	.....
						Memphis and Madison .....	2	.....
Lake City.....	17	1	4	3	0	Marked Tree and points below.....	25	.....
City St. Joseph.....	182	4	6			Memphis and Black Fish .....	14	152
Dolphin No. 3.....	355	4	0	6	6	.....do.....	37	.....
J. C. Adee.....	87	3	0	5	0	.....do.....	20	.....
Joy Patton.....	63	4	6	6	0	.....do.....	10	.....
						Memphis and Madison .....	1	.....
Satellite.....	60	4	0	5	5	Memphis and Black Fish .....	24	.....
						Memphis and Madison .....	1	.....
Dauntless.....	26	1	8	2	6	Marked Tree and Parkin .....	6	15
Fred Hartwig.....	246	4	0	5	0	Mississippi River and Parkin .....	1	.....



*List of vessels reporting having navigated St. Francis River, Ark., etc.—Cont'd.*

Name.	Net-tonnage.	Draft loaded.				Between—	Round trips.	Passen-gers.
		Steamer.		Barges.				
		<i>Ft.</i>	<i>in.</i>	<i>Ft.</i>	<i>in.</i>			
Wash Honshall .....	134	3	6	5	0	Mississippi River and Black Fish ...	1	.....
Birmingham .....	187	5	0	5	0	Helena and Black Fish .....	15	.....
Victor .....	100	3	0	5	0	do .....	5	.....
Nettie Johnson .....	72	4	0			Helena and Raggio .....	2	4
						Helena and Marianna .....	3	13
						Memphis and Marianna .....	2	5
Dora Clarke .....	13	2	0	3	6	Helena and Ashworth .....	43	150
Troya .....	5		8	1	4	Marianna and Parkin .....	50	.....
Ethel .....	4		7	1	4	do .....	4	.....
Indiana .....	8	2	2	3	6	Helena and Raggio .....	36	150
Eva .....	4		10	2	4	Wittsburg and Black Fish .....	30	.....
Ramblers .....	6	1	10	2	4	do .....	22	.....
Lone Star .....	5	1	0			Madison and Parkin .....	10	.....
Ruby .....	5	3	0	1	6	Madison and Lakeside .....	100	500
Arrow .....	4	1	4	1	2	Madison and Wittsburg .....	50	.....
Reinhart .....	5	1	4			Madison and Helena .....	12	.....

\* Gasoline-power boats. Others are steamboats.

*Classification of commerce reported, year ending May 31, 1907.*

Articles.	Tons.	Articles.	Tons.
Cotton .....	912	Staves and bolts .....	1,082
Cotton seed .....	1,184	Provisions .....	621
Grain .....	750	Miscellaneous freights .....	2,161
Live stock .....	252		
Saw logs .....	137,126	Total tonnage reported .....	151,015
Mussel shells .....	480		
Lumber .....	6,447	Estimated value .....	\$833,397



## APPENDIX Y.

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### REMOVING SNAGS AND WRECKS FROM MISSISSIPPI RIVER—IMPROVEMENT OF MISSISSIPPI RIVER BETWEEN THE OHIO AND MISSOURI RIVERS.

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REPORT OF COL. CLINTON B. SEARS, CORPS OF ENGINEERS, OFFICER IN CHARGE, FOR THE FISCAL YEAR ENDING JUNE 30, 1907.

#### IMPROVEMENTS.

- |  |  |
|--|--|
| 1. Removing snags and wrecks from the Mississippi River below the mouth of the Missouri River. | 2. Mississippi River between the Ohio and Missouri rivers. |
|--|--|
- 

ENGINEER OFFICE, UNITED STATES ARMY,  
*St. Louis, Mo., July 10, 1907.*

GENERAL: I have the honor to transmit herewith the annual report for the works under my charge for the fiscal year ending June 30, 1907.

Very respectfully,

CLINTON B. SEARS,  
*Colonel, Corps of Engineers.*

Brig. Gen. A. MACKENZIE,  
*Chief of Engineers, U. S. A.*

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#### Y I.

### REMOVING SNAGS AND WRECKS FROM THE MISSISSIPPI RIVER BELOW THE MOUTH OF THE MISSOURI RIVER.

A concise statement of the project for and history of this work will be found in the present Annual Report of the Chief of Engineers, United States Army, to which this is appended, as well as on page 2621 of the Annual Report of the Chief of Engineers for 1900.

This work is now being done by two large steel-hull snag boats—*H. G. Wright* and *J. N. Macomb*—fitted with all necessary tools and appliances and operated by hired men. They patrol the river between the mouth of the Missouri River and Natchez, Miss., occasionally going as far down as New Orleans, La.

Descriptions of these boats will be found in the Annual Report of the Chief of Engineers, 1895, page 2054 et seq.

#### OPERATIONS DURING THE FISCAL YEAR ENDING JUNE 30, 1907.

At the beginning of the year the repairs of the snag boats (begun during the latter part of the previous fiscal year) had not been entirely completed.

The repairs to the *J. N. Macomb* were completed on July 15, 1906, on which date the boat left Memphis, Tenn., and resumed the work of removing obstructions. The repairs to the *H. G. Wright* were completed August 2, 1906, on which date, leaving St. Louis, Mo., this boat also resumed search for obstructions. During the year these steamers patrolled the river between the mouth of the Missouri River and Kennerville, La., 17 miles above New Orleans, La., a distance of about 1,240 miles, and removed snags, wrecks, drift piles, and leaning trees wherever necessary and as conditions of the river were favorable for the work.

Both boats were laid up at St. Louis, Mo., for ordinary annual repairs, in the latter part of the fiscal year—the *Wright* from March 20 to May 21, 1907, and the *Macomb* from May 9 to the end of the year.

A summary of the work accomplished during the fiscal year is given in the following table:

Name.	Snags pulled.	Trees cut.	Drift piles removed.	Wrecks removed.	Miles traversed.
H. G. Wright .....	1,463	1,620	1	3	10,221
J. N. Macomb .....	1,876	1,152	22	4	11,594
Total .....	8,339	2,772	23	7	21,815

In addition to the work tabulated, the *Wright*, November 19–22, 1906, removed the wreck of the steamer *Elk* from the canal at Vicksburg, Miss.; February 20, 1907, broke up part of wrecked barge at Penitentiary Point, Ill.; February 25, 1907, worked on wreck of gasoline boat at Greenfield, about 5 miles above Cairo, Ill.; and the *Macomb*, November 6 and 20, 1906, removed a wrecked coal barge at Brooks Point, Ill.; November 9 and 10, 1906, removed wreck of a barge at Whitehouse, Mo.; November 17 to 20, 1906, removed wreck of steamer *Grand Tower* at Atherton, Ill.; November 23, 1906, rescued barge belonging to the Interstate Transportation Company of Hickman, Ky., which had broken from its moorings and had lodged on the head of Island No. 25.

The trees referred to are generally leaning timber in bends of the river, or trees that are liable to fall into the water and become obstructions to navigation.

#### APPROPRIATIONS.

The appropriations from the beginning of the work to the year 1878 were made in lump sums, principally under the titles of "Improvement of the Mississippi, Missouri, and Arkansas rivers," and were applied to several streams as their needs or the terms of the laws required. Appropriations from 1879 to 1888 were specifically made or allotted for this work. In the latter year, August 11, an annual appropriation of an amount not to exceed \$100,000 was made for this work, since which time the snag boats have patrolled the river whenever necessary, in order to keep the channel free from obstructions, such as logs, drift jams, leaning trees, and such wrecks as with their appliances they were able to remove or to break up with explosives.

The details of the expenditures and the work done are shown in the following table:

*Table of amount expended and work done in removing obstructions in Mississippi River between mouth of Missouri River and New Orleans, La., from March 28, 1868, to June 30, 1907.*

Years.	Amount expended.	Work done.			
		Snags pulled.	Trees cut.	Drift piles removed.	Wrecks removed.
March 28, 1868, to June 30, 1871.....		3,271	37,488	30	
Fiscal year ending June 30—					
1872.....		1,865	2,621	12	
1873.....	\$46,901.40	1,365	1,713	5	
1874.....	72,802.80	630	515	6	
1875.....	70,727.01	1,461	2,984	14	
1876.....	49,854.30	1,218	1,589	5	1
1877.....	36,220.08	676	403	4	
1878.....	20,122.54	889	3,346	1	
1879.....	121,820.16	1,133	2,690	5	
1880.....	74,988.94	1,522	60	19	
1881.....	102,308.43	1,057	647	6	
1882.....	75,311.29	1,909	4,983	32	
1883.....	69,540.59	2,775	26,297	34	
1884.....	18,390.48	968	4	3	
1885.....	45,395.47	1,692	16,900		
1886.....	20,047.71	693	567		
1887.....	43,583.12	2,080	5,289	10	
1888.....	17,302.29	798	348		
1889.....	67,511.37	1,864	9,102	34	8
1890.....	49,089.17	2,961	12,112	23	1
1891.....	92,720.97	3,450	21,316	37	
1892.....	98,250.00	3,389	20,571		
1893.....	96,497.23	2,946	8,214	16	
1894.....	88,252.46	3,067	22,861	19	5
1895.....	100,000.00	3,307	17,520	22	3
1896.....	80,496.26	2,979	19,648	11	1
1897.....	88,421.64	3,072	31,014	24	2
1898.....	88,917.74	4,253	14,856	32	3
1899.....	88,922.15	3,300	30,695	34	
1900.....	86,356.29	4,479	15,770	19	
1901.....	86,710.05	3,566	19,746	28	
1902.....	98,055.27	3,907	28,870	27	7
1903.....	72,587.48	1,562	6,895	2	
1904.....	88,245.25	4,654	17,034	18	2
1905.....	81,822.81	4,118	15,241	19	12
1906.....	85,662.36	2,564	14,478	16	
1907.....	85,669.59	3,339	2,772	23	7
Total.....	2,499,504.70	88,094	436,489	590	52

Amount expended from current allotment during the fiscal year was \$85,669.59. A statement of this expenditure, as required by law, is given in the accompanying table.

Authority was obtained, December 15, 1906, to use that part of the fund unexpended in the operations of the snagboats for the removal of Beaver Dam Rock (and other rocks), considered obstructive and dangerous in the channel, but, owing to the high stage of water had continuously since that date, work upon the rock has not been attempted, but has been deferred until the low water of the coming season.

The work done by the snag boats is of great benefit to the commerce and navigation on the river. Before the river was so completely patrolled as it now is, the sinking of steamboats and other river craft by running on snags was a common occurrence. During recent years such disasters seldom occur. Although life and property would seem to be much safer than formerly, the rate of insurance has not materially decreased.

It is proposed during the coming year to continue operating these snag boats, as provided in the river and harbor act of August 11, 1888.

The statistics relating to the commerce benefited by the operation of these snag boats will be found in the report of operations for this year for the improvement of the Mississippi River from the mouth of the Missouri to the mouth of the Ohio River, and in the Reports of the Mississippi River Commission and the district officers thereunder.

The headquarters of the snag boats is in St. Louis.

The amount of customs collected at St. Louis during the fiscal year was \$2,473,363.79.

The amount of internal revenue collected was \$8,153,432.02.

## ALLOTMENTS.

Previous to March 3, 1879 (approximated)-----	\$358, 627. 35	Fiscal year ending June 30—	
By act of—		1895-----	\$100, 000. 00
March 3, 1879-----	100, 000. 00	1896-----	80, 496. 26
June 14, 1880-----	100, 000. 00	1897-----	83, 421. 64
March 3, 1881-----	80, 000. 00	1898-----	88, 917. 74
March 2, 1882-----	85, 000. 00	1899-----	88, 923. 15
July 5, 1884-----	72, 950. 63	1900-----	86, 355. 29
August 5, 1886-----	56, 250. 00	1901-----	86, 710. 05
August 11, 1888-----	100, 000. 00	1902-----	93, 055. 27
Fiscal year ending June 30—		1903-----	72, 587. 48
1890-----	49, 089. 17	1904-----	88, 245. 25
1891-----	92, 720. 97	1905-----	81, 822. 81
1892-----	98, 250. 00	1906-----	85, 662. 36
1893-----	96, 497. 23	1907-----	85, 669. 59
1894-----	88, 252. 46	Total-----	2, 499, 504. 70

Amount drawn under section 7, act of August 11, 1888----- \$91, 318. 36  
 June 30, 1907, amount expended during fiscal year----- 85, 669. 59

July 1, 1907, balance unexpended----- 5, 648. 77  
 July 1, 1907, outstanding liabilities----- 5, 648. 77

July 1, 1907, amount available for fiscal year 1908----- 100, 000. 00

*Summary of expenses for operating U. S. snag boats H. G. Wright and J. N. Macomb in connection with the work of removing obstructions in Mississippi River during the fiscal year ending June 30, 1907.*

Application.	1906.					
	July.	Aug.	Sept.	Oct.	Nov.	Dec.
Office expenses-----	\$661. 64	\$5. 54	\$3. 00	\$10. 80	\$4. 89	\$74. 20
Expenses of snag boat H. G. Wright:						
Crew-----	1, 382. 33	2, 051. 83	2, 055. 00	2, 050. 51	2, 002. 50	2, 088. 00
Outfit-----	49. 35	25. 95	2. 70			11. 95
Fuel-----	129. 60	748. 84	994. 63	501. 89	1, 270. 88	871. 15
Subsistence-----	238. 64	616. 76	308. 85	675. 17	848. 55	759. 53
Supplies-----		30. 25	7. 75	177. 90	88. 75	
Repairs-----	500. 72	41. 14	21. 25	8. 36		
Miscellaneous-----					9. 70	
Expenses of snag boat J. N. Macomb:						
Crew-----	1, 847. 66	2, 098. 66	2, 125. 85	2, 045. 17	1, 978. 66	2, 095. 67
Outfit-----						
Fuel-----	700. 00	1, 268. 49	928. 75	1, 841. 90	614. 01	1, 288. 25
Subsistence-----	703. 07	364. 49	668. 53	888. 18	322. 17	806. 87
Supplies-----				12. 64		
Repairs-----				23. 22	2. 00	202. 98
Miscellaneous-----						
Total-----	6, 218. 01	7, 251. 95	7, 111. 81	7, 225. 24	6, 637. 11	7, 642. 60

*Summary of expenses for operating U. S. snag boats H. G. Wright and J. N. Macomb, etc.—Continued.*

Application.	1907.						
	Jan.	Feb.	Mar.	Apr.	May.	June.	Total.
Office expenses.....	\$715.80	\$66.09	\$685.08	\$835.07	\$711.90	\$16.25	\$3,789.71
Expenses of snag boat H. G. Wright:							
Crew.....	2,042.67	2,065.00	1,981.84	1,626.84	1,795.66	102.49	21,184.67
Outfit.....				846.88	451.00		887.83
Fuel.....	1,068.51	665.65	483.27	334.38	256.05	1,112.47	8,427.32
Subsistence.....	172.60	245.27	374.17	344.38	694.44	481.69	5,200.05
Supplies.....				639.34	120.80		1,064.79
Repairs.....				1,666.45	288.18	28.80	2,494.85
Miscellaneous.....							9.70
Expenses of snag boat J. N. Macomb:							
Crew.....	2,129.00	2,111.00	2,104.00	2,187.67	2,047.73	108.38	22,829.40
Outfit.....					143.22	863.14	1,006.36
Fuel.....	556.65	1,083.85	1,251.20	1,088.93	267.75	162.00	10,496.78
Subsistence.....	733.66	204.62	265.54	549.41	414.97	277.47	5,192.98
Supplies.....				41.79	237.07	130.30	421.80
Repairs.....					1,119.64	1,315.61	2,663.35
Miscellaneous.....							
Total.....	7,408.89	6,431.48	7,145.05	9,561.14	8,493.26	4,548.55	85,669.59

## Y 2.

IMPROVEMENT OF MISSISSIPPI RIVER BETWEEN OHIO AND MISSOURI RIVERS.

PROJECT OF 1881, REVISED IN 1883, 1903, AND 1905.

A concise statement of the project for and history of this work will be found in the Annual Report of the Chief of Engineers for 1906, page 462, as well as on page 2631 of the Report of the Chief of Engineers for 1900.

Reference should be made to the Report of the Chief of Engineers, United States Army, for 1894, pages 1577 et seq., for information relating to the development of the various forms of construction and for a résumé of the various types employed between 1872 and 1894, and to the Reports of the Chief of Engineers, United States Army, for 1895, page 2059; 1896, page 1717; 1897, page 2012; 1898, page 1698; 1900, page 2632, and 1901, page 2169, for minor details as to forms of construction.

Since the adoption of this project work has been done substantially according to the methods referred to above at the following localities: Mouth Missouri River, Sawyer Bend, St. Louis Harbor, Cahokia Chute, Arsenal Island, Horsetail bar, Carroll Island, Twin Hollows, Pulltight, Beards Island, Chesley Island, Jim Smiths, Sulphur Springs, Foster Island, Lucas, Herculanum, Calico Island, Cornice Island, Forest Home, Osborne Field, Michaels Landing, Rush Tower, Fish Bend, Danby Landing, Ames Island, Rush Towhead, Penitentiary Point, Sycamore Landing, Fort Chartres, Crooks, Turkey Island, Mudd Landing, Moro Island, Ste. Genevieve, Fairy Island, Kaskaskia Island, Horse Island, Chester, Crain Island, Liberty Island, Liberty Bend, Lacours Island, Willard, Hamburg, Devil Island, Minton Point, Cape Girardeau, Commerce Island, Burnham Island, Powers Island, Goose Island, Philadelphia Point, Commercial Point,

Prices Landing, Buffalo Island, Dogtooth Bend, Greenleaf Bend, Beechridge, Hurricane Field, Eliza Point, Greenfield Bend, and vicinity of Cairo.

During the fiscal year ending June 30, 1907, work for the permanent improvement of the river has been carried on, as hereinafter described, at Chesley Island, James Landing, Osborne Field, Penitentiary Point, Crain Island, Willard Landing, Devil Island, and Eliza Towhead. (See Pls. I and II.)

The project adopted for the permanent improvement of the Mississippi River between the mouths of the Ohio and Missouri rivers was approved by the Chief of Engineers, United States Army, March 31, 1881. The estimate of the cost, as revised in 1883, was \$16,397,500. The project was modified by the river and harbor act of June 3, 1896, to permit the construction and operation of dredges. It was again modified to some extent in 1903 by the Board of Engineers for Rivers and Harbors in report dated November 12, 1903, the dredging authorization of which was adopted by Congress in the river and harbor act of March 3, 1905.

The interpretation of this act virtually stopped all construction work for the permanent improvement of the river within the district, except for the small unexpended balances from previous appropriations. Attention being called thereto, an unallotted portion of the appropriation was made available by an act approved June 29, 1906, for the construction of works urgently needed.

By the report of 1903 the cost is increased \$20,000,000 in addition to expenditures already made, provided the projects in force be adhered to throughout. The cash expenditures to December 31, 1903, are considered as approximately the cost of the work up to the date of the report of the Board. They were \$10,476,654.53. The total estimated cost as last revised is therefore \$30,476,654.53.

The total amount appropriated to June 30, 1907, was \$12,654,999.98. Of this amount \$180,000 was allotted by acts and projects for improvement between the Illinois and Missouri rivers, including Alton Harbor, leaving a balance of \$12,474,999.98 to be applied to the project for the general improvement between the mouths of the Ohio and Missouri rivers. The balance of the last revised estimate not appropriated June 30, 1907, is therefore \$18,001,654.55.

#### WORKS OF IMPROVEMENT.

Because of the small balance of funds available, for the reasons stated, operations for the construction of works of permanent improvement were confined to the repair and maintenance of the hurdles and revetments already placed under the original project and to the extension of the system at two places only of those hereinbefore mentioned, at both of which work was urgently required. Three dredges were in commission throughout the fall, operating upon twelve obstructing bars which developed during the low-water season of navigation. The construction of the various parts of the two suction dredges, required by act of Congress approved March 3, 1905, was begun under contract, and at the close of the year fair progress had been made, much delay having been occasioned in procuring structural materials from the steel mills. The alterations to two older dredges were almost completed, having been carried as far as was thought



advisable until after experiment with certain parts during the coming dredging season. Such local surveys and examinations were made as were needed. Gauges were maintained and read throughout the year.

The plant was repaired and cared for at the engineer depot, St. Louis, and in the fleets at Claryville, Mo., and Santa Fe, Ill.

Materials were procured by contract, purchase in open market, and by hired labor, as was deemed most economical and advantageous to the United States. Stone was procured by contract throughout the year, and additional quantities which could not be so procured were quarried during the fall season at Little Rock, Mo., by hired labor. Piling was secured under contract and by purchase in open market. The price of lumber for mattress construction having risen to a figure which made its employment too costly, willow brush, the use of which was discontinued in 1899, was again resorted to and used exclusively, the brush being procured by hired labor.

The stages of the river were generally favorable for work during the fall and spring seasons, as no unusually high or low stages were reached; but the weather during the fall season was marked by frequent heavy rains, which, together with scarcity of labor, made the cost of the work done somewhat higher than it would otherwise have been. The same causes also retarded the delivery of materials, especially piling.

The general supervision of engineering operations during the year has been executed by Mr. Wm. S. Mitchell, assistant engineer. Operations at the engineer depot, the purchase and distribution of subsistence and supplies, the care and repair of plant and procuring stone at the Little Rock quarry were under the superintendence of Mr. C. D. Lamb, assistant engineer. The organization and direction of the field forces for construction were in local charge of Assistant Engineers W. M. Penniman and F. Y. Parker, the former also directing the parties procuring brush and loading pile timber. Local surveys and collection of physical data were under Junior Engineer Philip Florreich, jr. The drafting room was in charge of Junior Engineer J. W. Skelly. Draftsman and Inspector Holland W. Baker was in charge of the design of dredges Nos. 5 and 6 until the letting of the contract, since which time he has been stationed at Dubuque, Iowa, as the inspector for their construction. Junior Engineer E. C. Constance has been under the personal orders of Assistant Penniman. The dredges in operation, Nos. 2, 3, and 4, were in charge of masters of dredge Jas. E. Kennedy, Wm. Baxter, and L. H. Yourtee, respectively.

Reports from these assistants, giving the details and accompanied by charts showing the locations of the various works, are on file. The office has, as heretofore, been in charge of Mr. S. G. Clark, chief clerk.

#### CONSTRUCTION WORKS.

In the repair and construction of works of permanent improvement during the year the types of hurdles and revetments standard with this office for many years have been used and need not be further described than that the hurdles were permeable dikes of piling driven in one to three rows of three-pile clumps, as was demanded by the depths encountered, through wide foundation mattresses woven of willow brush. The bank revetments were of similar willow mats

extending below the low-water contours to the foot of the bank, with the upper bank surfaces faced with riprap as high as the natural slope would allow, dependence for grading being placed upon succeeding high stages of river, after each of which the stonework will be carried up the bank until the top is reached.

*Chesley Island, Missouri (19 miles below Eads bridge, St. Louis).* *Repair of bank protection.*—The foundation of this revetment was laid in 1882 and 1883, its original length being about 4,500 feet. The stonework was completed in 1885, since which time slight repairs in several years have been sufficient to maintain the efficiency of the protection. In recent years about 250 feet at the lower end of the work have been slowly worn away, and in 1904 an extraordinary freshet from the Meramec River cut away the entire head of the island behind the revetment, and the portion of the latter thus detached, about 1,300 feet in length, threatened to become an obstruction to navigation. In addition a bank slip about 300 feet in length occurred in the stonework a short distance below the eroded bank.

In October, 1906, to prevent further erosion and damage to the revetment, a protection mattress 875 feet in length was placed along the caving shore at the new head of the island, and above the mattress the bank was revetted with stone to a stage of 13 feet (St. Louis gauge), which was as high as was then practicable without extensive grading. In addition 305 linear feet of mattress, with stonework to the 20-foot stage, were placed in repair of the bank slip referred to.

It is probable that the stonework will be entirely completed during the coming low-water season.

The total length of the protection is now 3,825 feet.

*James Landing, Illinois (3½ miles below St. Louis).* *New bank protection.*—During the last few years the river at this locality had become excessively wide, with consequent bad navigation, the caving on the Illinois shore having entirely destroyed the James Landing hurdles, built 1891 and 1892. In order to check this movement of the channel to the east, and, incidentally, protecting the Monroe County levee, which was endangered, it was decided to extend the Osborne Field revetment upstream. The work was done during September and October (1906), 3,900 feet of mattress being placed, 650 feet of lumber on hand, the remainder, 3,250 feet, of brush, the width varying from 130 feet to 100 feet, depending on the depth of the water. The lower end of the mattress was connected with the shore-end mattress of old hurdle No. 3, thus making the total length of protection above that hurdle 4,030 feet. The entire length of bank along the mattress was graded and revetted with stone to the 14-foot stage, and 500 linear feet were raised to the 16-foot stage.

*Osborne Field (36 miles below St. Louis).* *Repair of bank protection.*—In order to stop the caving which had been slowly taking place in the bank behind the revetment at Osborne Field, placed in 1892, and which had reached a maximum width of erosion of 500 feet, two short hurdles were planned to connect the old revetment with the present bank and induce a fill to the former line. Of these only one, hurdle No. 2, was built, November, 1906, its length being 506 feet. The T-head was omitted, as the old revetment was deemed sufficient protection to the outer end.

In addition to the hurdle to check the erosion and rebuild the bank line, the lower end of the caving bank, about 1,400 feet below the

hurdle, was protected by a mattress 400 feet in length and stonework laid on a graded slope to the 16-foot stage. This new revetment lies in the sharp angle between the caving bank and the original revetment which was gradually being destroyed.

In this work there were placed 368 piles, 17 stringers, 118,250 square feet of mattress, and 31,000 square feet of stonework, raised to the 25-foot stage.

*Penitentiary Point, Ill. (42 miles below St. Louis). New hurdle for channel contraction.*—The first work at this locality was done in 1900, and consisted of a standard bank protection along 6,350 feet of bank, with stonework carried to the 14-foot stage, but about two-thirds of this work was entirely destroyed by the high waters in 1901–2, the bank line receding a maximum distance of about 500 feet. In 1903 another mattress was laid along this unprotected bank, while the remainder of the 1900 revetment was extended upstream to Fish Bend slough, and the stonework for a distance of 4,500 feet below that point was raised to the top of the bank, making the total length of wholly and partially protected bank 7,600 feet.

The spring high water of 1904, strongly deflected against this bank by the caving bank of Ames Island and the fast-growing bar below it, destroyed the lower portion of the new work which had been raised to the 15-foot stage, 3,380 feet being lost. During the following summer the remainder of the work, 4,220 feet, was repaired and raised to the 25-foot stage. The bank below the protection continued to recede, finally endangering the Monroe County levee, and the bar below Ames Island extended rapidly downstream and covered the approach and river front at Brickey Mill, threatening the destruction of river traffic at that landing.

In the spring of 1906, the local interests on both sides demanding it, a survey was made and a project for the construction of two hurdles below Penitentiary Point was submitted and approved. These hurdles were to preserve to navigation Brickey Mill Landing by removing the bar in front to restore the left bank, which had receded at the maximum point more than 2,000 feet, and to insure protection to the levee in Illinois. It was decided, however, to build only one (No. 1) of the hurdles at first and await its results before locating the second structure. Hurdle No. 1, begun in September and completed in November, 1906, is located 3,400 feet below the upper end of Penitentiary Point revetment, using that work for its root at the bank. The hurdle is 1,500 feet in length and its outer end is protected by a modification of the usual buttress and T-head, the latter being in three branches or "crow's foot," designed to govern more effectually the swirl around the end of the hurdle and lessen the eddy below.

In January, 1907, the hurdle was broken by a heavy run of ice and drift, when the stage of the river was abnormally high for that season of the year. Its repair was begun in March and completed early in May.

The repair hurdle bends upstream about 50 feet from the original line and is 450 feet in length.

Slight repairs were also made to the stonework at the shore end of the hurdle.

In May a great quantity of drift which had collected above the hurdle was distributed along the entire length of line and sunk in a mass, 30 feet to 40 feet in width and 5 feet to 15 feet in depth.

In this hurdle there were placed 2,032 piles, 319,600 square feet of foundation mattress, 60,715 square feet of drift mattress, 1,230 square feet of stonework.

It is yet too early to report definitely on the progress of erosion for the removal of the bar threatening Brickey Mill Landing, but there are indications of favorable action as the result of the channel contraction by this hurdle; the caving of the Illinois bank below the hurdle has been markedly checked, and it is thought will have ceased by the time of low water.

*Crain Island, Missouri (72 miles below St. Louis). Repair of hurdles.*—Both hurdle dams, Nos. 1 and 2, which have been broken for about two years, were repaired in June.

*Hurdle dam No. 1.*—There were two breaks in this structure which closes "Missouri Chute," their combined length being over 400 feet, both lying within 600 feet of the Puckett Island shore. The repair hurdle, 620 feet in length, was deflected upstream from the original line and joins the Puckett Island shore about 140 feet above the root of the old hurdle. In addition, the shore protection for the new hurdle end was extended as a bank protection 250 feet upstream to the present head of the island.

*Hurdle dam No. 2.*—The breaks in this hurdle aggregated about 100 feet in length, near the Crain Island side. The original foundation mattress having been found intact, the piling was restored on the old line. The shore protections were repaired and a mass of drift collected above the dam was distributed along the piling and sunk.

In repairs to this hurdle there were placed 615 piles, 30 stringers, 34,100 square feet of mattress, 13,500 square feet of stonework in revetment of the banks.

*Bank protection—Revetment.*—A large circular cave and eddy, about 125 feet radius, between stations 4 and 9 in the revetment of Crain Island, threatened further destruction of the revetment. To correct this condition and restore the bank lines, a sloping spur hurdle, 125 feet in length, was begun in this pocket and partly completed at the end of the year. The foundation mattress extends out to the old bank protection mattress which was found intact. Pile driving was begun on June 28, but was not completed at the end of the year.

*Willard Landing, Illinois (111 miles below St. Louis). Repair of hurdle.*—The hurdle dam at this locality, which had been broken for two years, was completed during April and May. All of the stonework and about 200 feet of the piling had been destroyed at the Illinois end of the dam, where the bank line had receded 200 feet.

This repair hurdle runs slightly upstream from the west end of the break in the old line, where the foundation was found intact, to the nearest point on shore, a distance of 350 feet. In addition several weak places in the hurdle were strengthened, so that the total length of piling line repaired was 620 feet.

In this work there were placed 456 piles, 33 stringers, 140,000 square feet of mattress, and 16,500 square feet of stonework in shore protection at the hurdle end.

*Devil Island, Illinois (120 miles below St. Louis). Repair of hurdle dam.*—The hurdle dam at the head of the island had suffered severely from ice and drift, which had destroyed much of the older piling. At the Illinois, or main-shore, end the connection had been destroyed, and on the hurdle line the bank had caved back a distance of 400 feet, permitting a considerable draft of water into the slough.

Repairs were begun late in June, and at the end of the year a foundation mattress 128 feet in width had been laid from the end of the old structure in a line almost directly upstream to the nearest point on shore, a distance of only 250 feet. Pile driving will be begun and the repairs completed early in July.

*Eliza Towhead, Illinois (168 miles below St. Louis). New bank protection.*—In 1876 the left bank of the Mississippi River had approached within 3,600 feet of the Ohio River, the narrowest part of the peninsula being near the present northern limits of Cairo, Ill., and the rapid erosion of the bank was naturally viewed with much alarm by its citizens. For the protection of the city and to preserve the regimen of the two rivers at their confluence, a revetment 10,700 feet in length was constructed during 1876, 1878, and 1879 in the bend between the foot of Dickey Island and the stone-spur dikes which had been built by the Cairo Land Company many years before at Eliza Point. In 1881 the channel shifted to the west side of the middle river bar at this place, and the accretions formed thereafter in the bend connected the bar with the mainland. The whole was soon overgrown with willows and the bar became "Eliza Towhead." Since 1896 the right bank of the river about 3 miles above has become deeply eroded, and the channel being sharply deflected by this Missouri bend and the bar below it against the Illinois shore, threatened to destroy Eliza Towhead.

For the protection of these accretions, which have been regarded as adding 1,600 feet to 2,000 feet of bank width to the security of the city of Cairo, a bank revetment was begun and partly completed in November and December, 1906. This revetment thus far is in four intermittent sections, each about 500 feet in length, with an equal interval between sections, thus leaving portions of unprotected bank. As the funds available for this work are limited, this method of extending the length of the protection was adopted, it having given fair results at other places.

There were placed 1,683 linear feet of mattress, thus protecting 3,100 feet of bank line, and as the work was done at high stages of water, the shore edges of the mats were held above the contour of low water and made secure with stone. Riprapping the upper bank was not attempted at the time, it being deemed best to defer that work until the coming season, with the expectation that the intervening high water would grade the bank to proper slope for the reception of the stone.

#### DREDGING.

Dredges Nos. 2, 3, and 4 were in commission from July 1 to December 15, 1906, and were operated as was necessary throughout the low-water season, and at the approach of winter were withdrawn from service and sent to harbor in anticipation of ice.

As far as was possible, attempt was made to anticipate with the dredges the shoaling on threatening bars to 8-foot depths, and except

at two closely adjacent places, Bee Bluff and Hamburg, governed by the same general conditions, the results were successfully attained, not less than the required depth being maintained throughout the season, although the river fell at the end of October to a stage of 5.8 feet on the St. Louis gauge. At the two places named a depth of 7 feet was had for about two weeks, the channel shifting so often that the dredges were unable to obtain the proper draft through any one dredge cut before the next entire change of channel, but finally the desired line and depth were secured.

The channels generally were in constant use by the river craft to their great relief and advantage.

The bars operated upon were at Pulltight, Chesley Island, Waters Point, Cliffdale Hollow, Grand Tower Island Bend, Crawfords, Willard Landing, Bee Bluff, Hamburg Island, Schenimann, Giboney Island, and Cape Girardeau Bend.

Slight relief was also given to the railway incline at Crystal City, and a navigable entrance was cut into the silted mouth of Big Muddy River for the use of lumber craft.

The total number of dredged channels at the 12 localities named, which are indicated on the accompanying charts, was 17, and their combined length is 34,000 feet.

The total amount of sand excavated was about 1,279,000 cubic yards in 2,125 hours' dredging, or at the rate of 600 cubic yards per dredge hour, and the final cost was about 8½ cents per cubic yard, which includes the cost of all idle time of the dredges and their crews and the repairs and upkeep of the former during the entire year.

The dredges were in operation only about one-third of the time they were in commission. The expense of running them for the entire time would have been increased only by the extra expense for fuel, oils, etc., and the reduction in cost for such continuous operation would have been about 60 per cent, or to 3¼ cents per yard.

Such fluctuations in the cost of the work are necessarily incident to the demand for dredging and are due to river conditions which can not be anticipated, although the dredges must be held in readiness for any conditions that may arise.

#### PLANT.

The structures and efficiency of the plant were maintained by extensive or ordinary repairs, as were required. No additions were made to any class of floating plant, but four barges and two pile drivers, all thoroughly worn out, were condemned and sold.

*Alterations of dredges Nos. 3 and 4.*—The installation of new sand pumps on these dredges was completed in August. The pumps were described in the report of this office for 1906 (p. 1407). Their operation has fully justified their construction and the necessary changes in installation, and has increased the efficiency of the dredges about 25 per cent. The new suction head of *No. 4* was not entirely satisfactory, as the throat was found to be too contracted and was often choked by drift and the caving of the face of the cutting, so as to almost entirely shut off the intake, involving considerable loss of time. It was so badly worn during the fall season that a new head was begun during the winter and completed in June. The new head is of the dustpan or shovel pattern, with the lower lip extending 24

inches beyond the upper and in a line with the bottom of the head and suction pipe. The opening is 12 inches deep, but can be closed by choke plates to any lesser opening desired.

*Dredge No. 4* has been equipped with 28-inch discharge pipe in place of the 24-inch heretofore used. The deck of *No. 4* was extended back 8 feet over the stern on outriggers, and the cabin will be extended a like distance, to furnish more room for crew and stores. The same changes will be made on *No. 3*, but the 28-inch pipe will be deferred until trial on *No. 4* has demonstrated its superiority.

*New dredges.*—Contract was entered into December 26, 1906, with the Dubuque Boat and Boiler Works, Dubuque, Iowa, for the construction of hulls, cabins, boilers, propelling machinery, and pontons for two self-propelling dredges to be known as *Nos. 5* and *6*, authorized by Congress March 3, 1905. After great and vexatious delay by the steel mills most of the material for the hulls has now been received, one of which is now fairly well set up, and riveting has been begun. Contracts were entered into February 6, 1907, with the E. H. Abadie Company, St. Louis, Mo., for the construction of sand pumps and engines, and March 8, 1907, with Schoellhorn-Albrecht Machine Company, St. Louis, Mo., for the construction of the hauling winches. Fair progress has been made in the construction of these machines, and they will probably be ready for delivery in August.

It has been hoped that one, at least, of these dredges would be ready for operation during the approaching low-water season, but the delays referred to have rendered this almost impossible, although the contractors are making every effort to secure the result desired.

*Engineer depot, etc.*—The buildings and shops at the engineer depot, all machinery, afloat and on shore, all vessels, plant, tools and appliances, etc., have been cared for and the ordinary repairs thereto, necessary for their maintenance and to fit them for the service required, have been made. Extraordinary repairs have been made to the steamer *Wm. R. King*, the boat being thoroughly overhauled for the first time since its launching. The steamer *Gen. H. L. Abbot* was renamed *Gen. J. H. Simpson*, in compliance with departmental instructions concerning the naming of vessels.

Of the floating plant on hand, much is beginning to show the effects of age and work and soon will require extensive repairs or to be dropped from the available list.

#### MATERIALS.

Of the materials required for construction works, the following amounts were procured by contract:

Piles, 3,429 sticks, 150,748 linear feet; stone, 21,080 cubic yards. The remainder of the piles, 1,369 sticks, were bought in open market, and the remainder of the stone, 10,454 cubic yards, was procured by hired labor at the quarries at Little Rock, Mo., which were in operation from September 18 to November 27, 1906. The brush, 9,634 cords, was procured by hired labor.

#### PHYSICAL DATA.

The gauges were maintained and read daily throughout the year and their records have been plotted on the hydrograph.

*Money statement.*

July 1, 1906, balance unexpended.....	\$642,055.45
Amount appropriated by river and harbor act approved March 2, 1907.....	250,000.00
June 30, 1907, miscellaneous receipts.....	2,365.33
	<hr/>
June 30, 1907, amount expended during fiscal year:	894,420.78
For works of improvement.....	\$82,161.72
For maintenance of improvement.....	234,677.46
	<hr/>
	316,839.18
July 1, 1907, balance unexpended.....	577,581.60
July 1, 1907, outstanding liabilities.....	30,982.84
	<hr/>
July 1, 1907, balance available.....	546,598.76
July 1, 1907, amount covered by uncompleted contracts.....	257,443.30
Amount (estimated) required for completion of existing project.....	18,001,654.55
	<hr/>
<div style="display: flex; align-items: center;"> <div style="font-size: 3em; margin-right: 10px;">{</div> <div> Amount that can be profitably expended in fiscal year ending June 30, 1909, for maintenance of improvement, in addition to the balance unexpended July 1, 1907.....  Submitted in compliance with requirements of sundry civil act of June 4, 1897, and of section 7 of the river and harbor act of 1896. </div> <div style="margin-left: 20px;"> 250,000.00 </div> </div>	

## APPROPRIATIONS.

June 10, 1872.....	\$100,000.00	March 2, 1895.....	\$758,333.33
March 3, 1873.....	200,000.00	June 3, 1896.....	275,000.00
June 23, 1874.....	200,000.00	June 4, 1897.....	673,333.33
March 3, 1875.....	200,000.00	July 19, 1897.....	325,000.00
August 14, 1876.....	200,000.00	July 1, 1898.....	673,333.33
June 18, 1878.....	240,000.00	March 3, 1899.....	673,333.33
March 3, 1879.....	200,000.00	June 6, 1900.....	100,000.00
June 14, 1880.....	250,000.00	June 13, 1902.....	650,000.00
March 3, 1881.....	600,000.00	March 3, 1903.....	650,000.00
August 2, 1882.....	600,000.00	April 28, 1904.....	650,000.00
July 5, 1884.....	520,000.00	March 3, 1905.....	650,000.00
August 5, 1886.....	375,000.00	March 2, 1907.....	250,000.00
August 11, 1888.....	300,000.00		
September 19, 1890.....	400,000.00	Total.....	12,654,999.98
July 13, 1892.....	525,000.00	Other receipts.....	14,412.43
March 3, 1893.....	658,333.33		<hr/>
August 18, 1894.....	758,333.33		12,669,412.41

## CONTRACTS IN FORCE.

Name: Dubuque Boat and Boiler Works.

Work: Parts of two hydraulic dredges.

Cost: \$238,000.

Date: December 26, 1906.

Date of commencement: Ten days after notice of approval.

Date of completion: April 30, 1908.

Name: The E. H. Abadie Company.

Work: Four main-pump engines and two centrifugal dredging pumps for two hydraulic dredges.

Cost: \$34,595.

Date: February 6, 1907.

Date of commencement: Promptly after notification of approval.

Date of completion: March 31, 1908.



Name: Schoellhorn-Albrecht Machine Company.  
 Work: Four hauling winches for two hydraulic dredges.  
 Cost: \$6,400.  
 Date: March 8, 1907.  
 Date of commencement: Upon receipt of notification of approval.  
 Date of completion: March 31, 1908.

## COMMERCIAL STATISTICS.

*Receipts and shipments at St. Louis, Mo., during the year 1906.*

Receipts:	Tons.
Barbed wire, ores, and metals (pig and manufactured)-----	
Coal and coke-----	160, 120
Cotton and cotton products-----	1, 839
Groceries and dairy products-----	1, 046
Hay, seed, grain, flour, meal, etc-----	27, 734
Live stock and products-----	25, 420
Lumber-----	6, 554
Merchandise and sundries-----	89, 891
Vegetables and fruits-----	14, 945
Wines and liquors-----	5
Wool-----	116
Total-----	327, 670

Shipments:	
Barbed wire, ores, and metals (pig and manufactured)-----	1, 470
Coal and coke-----	25
Cotton and cotton products-----	306
Groceries and dairy products-----	6, 239
Hay, seed, grain, flour, meal, etc-----	7, 629
Live stock and products-----	5, 224
Lumber-----	2, 762
Merchandise and sundries-----	55, 467
Vegetables and fruits-----	3, 415
White lead, oils, etc-----	824
Wines and liquors-----	5, 824
Wool-----	
Total-----	89, 185

*Transferred by ferries across the river at St. Louis.*

	Tons.		Tons.
1903-----	6, 328, 635	1905-----	6, 684, 949
1904-----	6, 080, 109	1906-----	7, 374, 978

Shipments of grain, including flour, meal, etc., and coal down the river from landings between St. Louis and Cairo during the year 1906 amounted to 62,238 tons.

*List of steam-power boats that arrived at St. Louis during the year 1906.*

[Exclusive of Government vessels.]

Size of boats.	Draft.	Number.	Times arrived.
	<i>Feet.</i>		
Under 500 gross tons-----	2.5-6.0	74	1, 108
Between 500 and 1,000 gross tons-----	4.0-7.6	11	864
Total-----		85	1, 467

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## *List of barges and scows that arrived at St. Louis during the year 1906.*

[Exclusive of Government vessels.]

Size of boats.	Draft.	Number.	Times arrived.
	<i>Fed.</i>		
Under 500 gross tons.....	2.6-7.5	15	356
Between 500 and 1,000 gross tons.....	5.2-8.0	0	0
Total .....		15	356

## *Number of vessels and their tonnage permanently and temporarily enrolled and licensed at the port of St. Louis, Mo., December 31, 1906.*

	Number of vessels.	Gross tonnage.	Net tonnage.
Permanent enrolled steamers:			
Wood.....	63	17,919	16,756
Iron and steel .....	8	2,814	2,140
Permanent enrolled barges:			
Wood.....	6	589	589
Iron and steel .....	1	1,162	1,162
Permanent enrolled steam yachts:			
Wood.....	4	370	272
Iron and steel .....	8	274	220
Licensed steamers:			
Wood.....	21	268	214
Iron and steel .....	2	56	29
Licensed barges, wood.....	1	16	16
Licensed sailing yachts, wood .....	1	9	8
Licensed steam yachts, wood .....	5	84	68
Total .....	115	23,551	21,476

Total cost and work done to June 30, 1907.

	New.			Completion or restoration.			Ordinary repairs.			Total cost.
	Linear feet.	Square feet.	Cost.	Linear feet.	Square feet.	Cost.	Linear feet.	Square feet.	Cost.	
<b>Hurdles:</b>										
Prior to July 1, 1906.....	413, 583			8, 115			35, 690			\$6, 295, 069. 91
During fiscal year ending June 30, 1907—										
Penitentiary Point.....	1, 500		\$40, 897. 63	1, 500		\$9, 491. 16	410		\$25, 077. 16	75, 465. 95
Crain Island.....							890		25, 141. 39	25, 141. 39
Willard.....							620		22, 119. 34	22, 119. 34
Devil Island.....							80		2, 398. 24	2, 398. 24
Total.....	415, 083			9, 615			37, 690			6, 420, 194. 83
<b>Bank protection—Mattress:</b>										
Prior to July 1, 1906.....	295, 312	34, 392, 346								
During fiscal year ending June 30, 1907—										
Chesley Island.....								860, 875		
James Landing.....	3, 900	498, 750						96, 250		
Osborne Field.....	1, 683	249, 500						148, 000		
Eliza Towhead.....										
Total.....	590, 895	35, 040, 596						1, 105, 125		
<b>Bank protection—Revetment:</b>										
Prior to July 1, 1906.....		13, 001, 471								
During fiscal year ending June 30, 1907—										
Chesley Island.....								2, 286, 867		
James Landing.....		96, 620						34, 420		
Osborne Field.....								381, 965		
Crain Island.....					24, 000					
Eliza Towhead.....		3, 450								
Total.....		13, 101, 541			24, 000			2, 302, 252		3, 028, 385. 53
<b>Dikes and dams:</b>										
Prior to July 1, 1906.....	39, 367									814, 858. 33
During fiscal year ending June 30, 1907—										
Jetties:										
Prior to July 1, 1906.....										114, 038. 53
During fiscal year ending June 30, 1907—										

*Total cost and work done to June 30, 1907—Continued.*

	New.		Completion or restoration.		Ordinary repairs.		Total cost.
	Linear feet.	Square feet.	Linear feet.	Square feet.	Linear feet.	Square feet.	
Dredging:							
Prior to July 1, 1906.....							\$454,024.08
During fiscal year ending June 30, 1907.....							105,468.48
Total.....							559,492.56
Surveys, examinations, gauges, etc.:							
Prior to July 1, 1906.....							271,224.32
During fiscal year ending June 30, 1907.....							8,168.87
Total.....							279,393.19

*Recapitulation.*

Hurdles.....	\$6,420,194.83
Bank protection.....	3,028,385.53
Dikes and dams.....	814,358.53
Jetties.....	114,603.53
Dredging.....	559,492.56
Surveys, examinations, gauges, etc.....	279,393.19
Total to June 30, 1907.....	11,216,427.97

*Property account.*

Class.	Value July 1, 1906.	Debits.	Credits.	Value June 30, 1907.
Steamer Gen. T. L. Casey .....	\$3,521.44		\$1,230.28	\$7,291.16
Steamer Gen. J. H. Simpson .....	15,532.02	\$9,478.00	11,718.43	13,289.59
Steamer Wm. R. King .....	43,968.71	31,004.48	28,141.18	51,827.01
Dredge No. 2 .....	6,788.02	13,978.41	14,968.43	5,798.00
Dredge No. 8 .....	76,559.01	17,743.01	22,267.65	72,084.37
Dredge No. 4 .....	73,774.89	24,552.87	28,912.97	69,414.79
Dredges Nos. 3 and 4, alterations .....	13,424.21	8,436.04		21,860.25
Dredges Nos. 5 and 6, construction .....	11,943.90	26,728.03		38,671.93
Steam tenders, wood, 5 .....	11,346.62	1,417.57	3,055.59	9,707.60
Steam tenders, steel, 3 .....	89,843.10	1,718.91	4,044.08	37,017.93
Barges, model, 58 .....	108,203.98	4,962.02	20,916.97	92,249.03
Barge, flat, 1 .....	3,161.81		456.49	2,705.32
Store boat .....	1,364.56	183.62	380.63	1,167.55
Quarter boats, 10 .....	13,475.03	3,766.71	3,457.02	13,344.72
Office and survey boats, 5 .....	11,450.97	1,703.11	3,356.34	9,797.74
Pile drivers, 25 .....	37,812.02	2,693.34	8,189.44	32,315.92
Derrick boats, 2 .....	2,936.89	2,177.25	601.19	4,512.96
Derricks, 2 .....	1,552.79		224.18	1,328.61
Flats, wood, 70 .....	11,526.55	1,570.63	3,234.77	9,862.41
Flats, steel, 8 .....	11,606.47	222.85	908.73	10,919.59
Small boats, 99 .....	2,215.07	1,416.75	1,748.05	1,888.77
Portable quarters, 29 sections .....	1,021.89	288.42	435.95	874.36
Jetty gates .....	4,040.77		583.39	3,457.38
Engineer depot .....	23,703.16	1,996.19	5,418.33	20,281.02
Tools and appliances .....	14,876.32	4,787.62	6,556.93	13,107.01
Boarding outfit .....	11,353.54	1,693.52	3,024.13	10,022.98
Office furniture .....	780.80	451.75	122.10	1,110.45
Survey instruments .....	1,110.38		160.31	950.07
Total .....	568,387.92	162,969.10	174,513.56	556,843.46

*Material account.*

Class.	Value July 1, 1906.	Debits.	Credits.	Value June 30, 1907.
Subsistence .....	\$479.74	\$32,489.65	\$32,117.59	\$351.80
Brush .....		24,041.02	22,566.74	1,475.28
Files .....		30,611.04	22,718.68	7,892.36
Stone, United States Quarry .....		16,493.78	16,493.78	
Stone, contract .....		22,498.25	22,046.61	451.64
Rope .....	18,867.24	2,809.66	5,298.28	16,383.62
Wire .....	168.30	3,568.00	2,292.64	1,443.66
Iron .....	3,936.26	1,872.45	1,397.20	4,411.51
Nails .....	482.38	470.73	468.60	494.51
Spikes .....	741.20	90.40	256.98	574.62
Lumber, miscellaneous .....	10,962.22	1,686.36	4,007.38	8,671.20
Lumber, mattress .....	1,350.50	90.00	1,440.50	
Oakum .....	18.68	951.00	464.87	504.81
Coal .....	4,658.92	35,993.56	37,907.56	2,744.92
Ice .....		2,732.49	2,732.49	
Material, miscellaneous .....	8,908.88	14,292.37	14,589.41	8,661.84
Total .....	50,594.32	190,700.76	186,743.31	54,551.77

*Engineer office, U. S. Army, in account with United States from 1870 to June 30, 1907.*

To allotments, appropriations, etc., prior to July 1, 1906:	
1872-1906. Allotments for surveys .....	\$55,483.77
1876-1897. Special appropriations .....	401,600.00
1879-1906. Miscellaneous receipts .....	14,202.93
1872-1906. Appropriations for general improvement .....	12,429,999.98
	<u>\$12,901,286.68</u>

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Mar. 2, 1907. Appropriations, Mississippi River between Ohio and Missouri rivers -----		\$250,000.00
To miscellaneous receipts deposited:		
July 17, 1906. Rental of pile driver-----	\$3.00	
July 24, 1906. Unclaimed wages due employees--	6.67	
Dec. 3, 1906. Sale of condemned property-----	400.00	
Mar. 11, 1907. Sale of blueprints-----	7.82	
June 20, 1907. Sale of condemned property-----	1,943.20	
June 27, 1907. Sale of blueprints-----	4.64	
		2,365.33
June 30, 1907. Unpaid percentage on annulled contract-----	900.17	
Unpaid percentage on contracts in force-----	5,460.30	
Unpaid labor-----	19,754.81	
Unpaid miscellaneous-----	11,782.22	
		37,897.50
Total -----		13,191,549.51
June 30, 1907. By construction between Illinois and Missouri rivers:		
Piassa Island dam-----	37,910.41	
Piassa Island dam, cutting channel-----	3,116.86	
Alton dam-----	33,740.05	
Alton dike-----	126,652.74	
		201,420.06
By construction between Ohio and Missouri rivers:		
Hurdles-----	6,420,194.83	
Bank protection-----	3,028,385.53	
Dikes and dams-----	814,358.33	
		10,262,938.69
Jetties-----	114,603.53	
Dredging-----	559,492.56	
Surveys, etc-----	279,393.19	
		953,489.28
By withdrawn for Office of Chief of Engineers---		2,220.50
By withdrawn for Board of Engineers for Rivers and Harbors-----		800.00
By loss account-----		581,182.03
By property on hand-----		556,843.46
By material on hand-----		54,551.77
By models for Louisiana Purchase Exposition, 1904-----		522.12
By appropriations unexpended, Mississippi River, Ohio, to Missouri river-----		577,581.60
Total -----		13,191,549.51

## APPENDIX Z.

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OPERATING SNAG BOATS AND DREDGE BOATS ON UPPER MISSISSIPPI RIVER; IMPROVEMENT OF MISSISSIPPI RIVER BETWEEN MOUTH OF MISSOURI RIVER AND ST. PAUL, MINN., AND OF HARBOR AT MOLINE, ILL.; OPERATING AND CARE OF GALENA RIVER IMPROVEMENT, ILLINOIS, AND OF ILLINOIS AND MISSISSIPPI CANAL AROUND THE LOWER RAPIDS OF ROCK RIVER, ILLINOIS.

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REPORT OF MAJ. C. S. RICHÉ, CORPS OF ENGINEERS, OFFICER IN CHARGE, FOR THE FISCAL YEAR ENDING JUNE 30, 1907.

### IMPROVEMENTS.

- |  |   |
|--|---|
| 1. Operating snag boats and dredge boats on upper Mississippi and Illinois rivers. | 5. Operating and care of Illinois and Mississippi Canal around the lower rapids of Rock River at Milan, Illinois. |
| 2. Mississippi River between mouth of Missouri River and St. Paul.                 | 6. Illinois and Mississippi Canal; improvement of Rock River pool.  |
| 3. Operating and care of Des Moines Rapids Canal and Dry Dock.                     | 7. Operating and care of Galena River improvement, Illinois.  |
| 4. Mississippi River at Moline, Illinois.  |   |
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UNITED STATES ENGINEER OFFICE,  
*Rock Island, Ill., July 6, 1907.*

GENERAL: I have the honor to transmit the annual report on improvement work in this district for fiscal year ending June 30, 1907.

Very respectfully, your obedient servant,

C. S. RICHÉ,  
*Major, Corps of Engineers.*

Brig. Gen. A. MACKENZIE,  
*Chief of Engineers, U. S. A.*

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### Z 1.

OPERATING SNAG BOATS AND DREDGE BOATS ON UPPER MISSISSIPPI RIVER AND ILLINOIS RIVER.

The work performed under this appropriation consists chiefly in the removal of snags, wrecks, rocks, and other obstructions to navi-

gation. The operations extend from Minneapolis to the mouth of Missouri River, a distance of about 670 miles, and from the mouth of the Illinois River to Copperas Creek, 138 miles.

There belongs to this work the snag boat *Col. A. Mackenzie*, built in 1900, but dredges, drill boats, and tenders are borrowed from other works when required.

Snag-boat and dredge-boat operations are, and have been for the past thirty-one years, in local charge of Principal Assistant Engineer C. W. Durham, from whose report the following details are taken:

During the past year the snag boat was employed from July 1 to November 8, 1906, and from April 23 to June 30, 1907, in removing snags and other obstructions, placing buoys, making surveys and inspections, and otherwise assisting the interests of navigation on the upper Mississippi River between Minneapolis and the mouth of Missouri River and on the Illinois River between its mouth and Copperas Creek. In May, 1907, additional work was performed in the Illinois River between Copperas Creek and La Salle, the result of which is given in the summary, but the work was paid for by the appropriation for improving the Illinois River.

#### Summary.

Designation.	Mississippi River.	Illinois River.	Total.
Snags and stumps removed .....	617	115	732
Stumps destroyed .....	204	.....	204
Leaning trees pulled back .....	848	27	870
Large trees felled (over 8 inches diameter) .....	1,664	262	1,916
Small trees felled (under 8 inches diameter) .....	1,724	237	1,961
Surveys, days .....	44	.....	44
Buoys placed .....	12	.....	12
Mooring chains placed .....	3	.....	3
Sunken barges raised .....	8	.....	8
Wrecks removed .....	0	1	1
Miles run .....	4,521	448	4,969

*Operations of dipper dredge Phoenix.*—Dredge *Phoenix* was engaged from August 6 to 16, 1906, at the steamboat landing at Fulton. An area of 18,700 square feet was dredged over, and 5,350 cubic yards of sand were removed at a cost of \$546.75, a portion of which amount was paid for from the general appropriation. The results of this dredging were unsatisfactory. From August 16 to 21 the dredge was employed at the Davenport landing, where an area of 14,625 feet was covered, and 2,670 cubic yards of mud were removed at a cost of \$364.54. The results of this dredging were very good.

*Operations of hydraulic-dredge Hecla.*—The *Hecla* was employed August 3 to 8, 1906, removing a bar which had formed at the steamboat landing at Keokuk. The material removed, 3,432 cubic yards, was fine sand, and the cost was \$250.87, part of which was paid by the general appropriation. From August 9 to 22 she was engaged in dredging at Hamburg, where a bar had completely shut off the steamboat landing. The area dredged over was 99,000 square feet; the grade,  $7\frac{1}{2}$  to 9 feet at low water; the material, coarse sand; the quantity, 21,915 cubic yards, and the cost, \$840.16. From October 15 to 27 she was employed in cutting a channel through the bar at Curtis Point, 90 feet in width and 1,000 feet long. The area covered at this locality was 90,000 square feet; the grade, 8 feet at low water; the material dredged, consisting of sand, 51,921 cubic yards, and the cost, \$999.97.

The total tonnage of the Mississippi River between the Falls of St. Anthony and mouth of Missouri River for the calendar year 1906 was approximately 3,847,319 tons, and the ton-miles, 698,031,841. This includes logs and lumber.



## ABSTRACT OF APPROPRIATIONS AND ALLOTMENTS.

By act approved March 2, 1867.....	\$96,000	By act of August 11, 1888, for fiscal year ending—	
By allotment from appropriation of July 25, 1868.....	26,000	June 30, 1889.....	\$25,000
By allotment from appropriation of 1869.....	35,640	June 30, 1890.....	25,000
By act approved—		June 30, 1891.....	25,000
July 11, 1870.....	36,000	June 30, 1892.....	25,000
March 3, 1871.....	42,000	June 30, 1893.....	25,000
June 10, 1872.....	42,000	June 30, 1894.....	25,000
March 3, 1873.....	25,000	June 30, 1895.....	25,000
June 23, 1874.....	25,000	June 30, 1896.....	25,000
March 3, 1875.....	25,000	June 30, 1897.....	25,000
August 14, 1876.....	30,000	June 30, 1898.....	25,000
June 18, 1878.....	41,500	June 30, 1899.....	25,000
March 3, 1879.....	20,000	June 30, 1900.....	24,944
June 14, 1880.....	8,000	June 30, 1901.....	25,000
March 3, 1881.....	25,000	June 30, 1902.....	25,000
By act passed August 2, 1882.....	25,000	June 30, 1903.....	25,000
By act approved August 5, 1886.....	22,500	June 30, 1904.....	25,000
		June 30, 1905.....	25,000
		June 30, 1906.....	25,000
		June 30, 1907.....	25,000
		Total.....	999,584

## STATISTICS OF COMMERCE AND NAVIGATION.

*Lumber.*—The most important business at present carried on in connection with the navigation of the upper Mississippi River and its principal tributaries is the lumber trade, which, although rapidly declining, owing to the disappearance of the pine forests in Minnesota and Wisconsin, gave employment in 1906 to 20 raft boats, which distributed logs from the upper waters to the various mills scattered along the river from Minneapolis to St. Louis, and also brought down, chiefly to points below the Des Moines Rapids, much lumber from the St. Croix River. The manufactures of these mills in 1906 were: White pine lumber, 475,734,000 feet B. M.; shingles, 8,122,000; laths, 95,662,000, and hemlock lumber, 79,229,000 feet B. M.

*Lumber manufacture, Upper Mississippi River Valley, 1906.*

[Value about \$29,000,000.]

Locality.	Lumber.	Shingles.	Lath.
	<i>Feet B. M.</i>	<i>Number.</i>	<i>Number.</i>
Above Minneapolis.....	576,641,000	31,332,000	143,310,000
Minneapolis.....	291,020,000	1,401,000	54,744,000
St. Paul to Missouri River.....	184,714,000	6,721,000	40,918,000
St. Croix River.....	102,768,000	13,775,000	32,366,000
Chippewa River.....	89,473,000	25,298,000	32,357,000
Black River.....	400,000		50,000
Total.....	1,245,016,000	78,522,000	303,745,000

The larger part of the above was floated for greater or less distance on the Mississippi River either as logs or lumber.

*Steamboats and freight.*—There were employed between Minneapolis and St. Louis during 1906, 20 raft boats, 26 packets, 48 towboats, 20 ferryboats, 125 pleasure boats, and 20 Government boats; in all, 259 steamboats, with a gross tonnage of about 14,625 tons. In addition to the above, there are about 200 barges of various sizes used for transporting freight and construction material.

The principal steamboat lines on the upper Mississippi River are the Diamond Jo, the Eagle, the Carnival City, and the Acme packet companies. The number of passengers carried by all boats (including the ferries, 669,896) in 1906 was 2,023,332. The quantity of freight carried by all boats, including the rock and brush loaded on barges and used in Government work, and also including logs

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and lumber floated down the stream, is shown in the following table, together with the ton-miles and approximate valuation:

*Upper Mississippi River freight statement for 1906.*

Designation.	Tons.	Ton-miles.	Valuation.
Logs.....	2,525,390	686,601,400	\$11,703,799
Rafted lumber, shingles, etc.....	104,751	89,866,185	2,286,517
Miscellaneous freight.....	1,001,867	20,072,604	20,272,009
Government material.....	215,811	1,491,652	102,654
Total.....	3,847,319	696,031,841	34,364,979

The following table affords a view of the amount of navigation at various localities on the upper Mississippi River for the year 1906:

*List of steamboats, barges, and rafts passing through various bridges.*

Locality of bridge.	Miles from St. Paul.	Steam-boats.	Barges.	Rafts.
St. Paul Park.....	11	1,023	290	184
Hastings.....	28	1,069	173	228
Frescott.....	30	1,751	887	466
Reeds.....	78	1,015	432	190
Winona.....	116	1,891	950	408
La Crosse.....	143	1,652	682	178
Dubuque.....	265	659	451	144
Sabula.....	310	746	478	(a)
Clinton.....	327	1,611	486	(a)
Rock Island.....	363	3,277	2,123	120
Keithsburg.....	417	631	66	65
Burlington.....	441	1,313	286	90
Fort Madison.....	462	1,033	158	85
Keokuk.....	484	1,064	244	24
Quincy.....	521	1,086	250	22
Hannibal.....	540	611	279	16
Louisiana.....	568	992	398	2
Alton.....	652	1,432	104	2

\* No record.

° Partial record.

*Internal revenue for the year ending December 31, 1906, collected in districts bordering on the upper Mississippi River.*

District.	Office.	Amount.
Minnesota.....	St. Paul.....	\$1,678,352.97
Second Wisconsin.....	Madison.....	972,519.99
Third Iowa.....	Dubuque.....	419,728.00
Fourth Iowa.....	Burlington.....	515,984.70
Fifth Illinois.....	Peoria.....	34,919,881.95
Eighth Illinois.....	Springfield.....	11,127,163.12
Thirteenth Illinois.....	East St. Louis.....	516,011.59
First Missouri.....	St. Louis.....	8,029,711.20
Total.....		58,178,863.52

*Customs revenue and tonnage for the year ending December 31, 1906.*

Port.	Collections.	Tonnage enrolled.	Vessels.
St. Paul, Minn.....	\$1,068,923.29	2,911	32
La Crosse, Wis.....	23.47	1,943	32
Dubuque, Iowa.....	23,619.33	823	22
Rock Island, Ill.....	84.29	6,051	125
Burlington, Iowa.....	81.61	2,117	55
St. Louis, Mo. <sup>a</sup> .....	2,268,157.18	23,651	115
Total.....	3,350,850.17	37,396	381

\* Only a part of the St. Louis statement is applicable to the upper Mississippi.

*Summary of expenditures for operating snag boats and dredge boats on upper Mississippi River for fiscal year ending June 30, 1907.*

Month.	Office expenses, superintendence, and contingencies.	Care, repair, and operating snag boats and dredge boats.						Grand total.
		Labor.	Subsistence.	Fuel.	Expense.	Repairs.	Total.	
1906.								
July.....	\$81.25	\$1,425.67	\$390.31	\$244.60	\$1,115.08	\$270.91	\$3,446.57	\$3,527.82
August.....	85.75	1,415.84	347.96	146.60	6.90	16.81	1,938.11	2,018.86
September.....		1,128.99	549.24	333.58	143.26	177.24	2,332.21	2,332.31
October.....	156.00	3,368.86	350.90	815.19	7.28	120.73	4,662.96	4,818.96
November.....	92.49	781.14	245.24	724.65	11.75	167.47	1,930.25	2,022.74
December.....	85.82	227.50				202.70	430.20	516.02
1907.								
January.....	425.00					196.74	196.74	621.74
February.....	29.75	225.00				441.23	666.23	695.98
March.....		516.67				142.51	659.18	659.18
April.....		183.36			117.85	337.14	638.35	638.35
May.....	168.57	1,801.35	464.37	290.80	451.50	912.04	3,920.06	4,083.63
June.....	650.00	1,423.33	360.08	541.85	8.82	80.33	2,414.41	3,064.41
Total .....	1,769.63	12,497.21	2,708.10	3,097.27	1,862.44	3,065.35	23,230.37	25,000.60

## Z 2.

**IMPROVEMENT OF MISSISSIPPI RIVER BETWEEN MOUTH OF MISSOURI RIVER AND ST. PAUL.**

The balance available July 1, 1907, will be applied at the various localities indicated in the annual project, in the construction of dams and shore protections and in auxiliary dredging, both by hired labor and contract.

A considerable sum (\$280,000) will be expended in purchase, repair, and construction of floating plant in preparation for the vigorous prosecution of work on the 6-foot channel project adopted by Congress March 2, 1907, the estimate for which is given below. The full project is published in Document 341, Fifty-ninth Congress, second session.

*Estimate for a 6-foot channel at low water, Mississippi River, St. Paul to Missouri River.*

Division.	Rock at \$1.35 per cubic yard.	Brush at 45 cents per cubic yard.	Probable cost.	Total.
<b>St. Paul to foot of Lake Pepin:</b>	<i>Cub. yards.</i>	<i>Cub. yards.</i>		
Dams and shore protections.....	312,300	624,600	\$702,675	\$1,058,025
Repairs to existing work.....	121,000		163,350	
Dredging, 1,600,000 cubic yards, at 12 cents.....			192,000	
<b>Lake Pepin to Winona:</b>				
Dams and shore protections.....	387,000	774,000	870,750	1,308,035
Repairs to existing work.....	106,878		144,285	
Dredging, 2,400,000 cubic yards, at 12 cents.....			288,000	
<b>Winona to Wisconsin River:</b>				
Dams and shore protections.....	1,029,438	2,058,867	2,316,225	2,632,725
Repairs to existing work.....	50,000	20,000	76,500	
Dredging, 2,000,000 cubic yards, at 12 cents.....			240,000	
<b>Wisconsin River to Savanna:</b>				
Dams and shore protections.....	1,040,000	1,565,000	2,108,250	2,316,750
Repairs to existing work.....	30,000		40,300	
Dredging, 1,400,000 cubic yards, at 12 cents.....			168,000	
<b>Savanna to Rock Island Rapids:</b>				
Dams and shore protections.....	721,160	1,081,740	1,460,349	1,876,599
Repairs to existing work.....	15,000		20,250	
Dredging, 800,000 cubic yards, at 12 cents.....			96,000	

## 1560 REPORT OF THE CHIEF OF ENGINEERS, U. S. ARMY.

Estimate for a 6-foot channel at low water, etc.—Continued.

Division.	Rock at \$1.35 per cubic yard.	Brush at 45cents per cubic yard.	Probable cost.	Total.
Rock Island Rapids:				
Canal and rock excavation .....	Cub. yards.	Cub. yards.		3,099,080
Rock Island to Burlington:				
Dams and shore protections .....	972,057	1,379,203	1,982,918	2,200,918
Repairs to existing work .....	45,000	25,000	72,000	
Dredging, 800,000 cubic yards, at 12 cents .....			96,000	
Rock excavation, 25,000 cubic yards, at \$4 .....			100,000	
Burlington to Montrose:				
Dams and shore protections .....	252,359	381,063	512,163	623,163
Repairs to existing work .....	40,000	20,000	63,000	
Dredging, 400,000 cubic yards, at 12 cents .....			48,000	
Des Moines Rapids:				
Dam above guard lock .....	5,000	5,000	9,000	355,800
Rock excavation, 86,700 cubic yards, at \$4 .....			346,800	
Keokuk to Hannibal:				
Dams and shore protections .....	501,882	744,941	1,012,764	1,246,514
Repairs to existing work .....	60,000	15,000	87,750	
Dredging, 400,000 cubic yards, at 12 cents .....			48,000	
Rock excavation, 28,000 cubic yards, at \$3.50 .....			98,000	
Hannibal to Missouri River:				
Dams and shore protections .....	1,007,382	1,695,510	2,122,945	2,717,391
Repairs to existing work .....	150,248	150,248	270,446	
Dredging, 2,700,000 cubic yards, at 12 cents .....			324,000	
Total .....	6,846,699	10,540,170		19,130,000
Maintenance during construction .....				870,000
Grand total .....				20,000,000

NOTES.—If the reservoirs near the headwaters of the Mississippi River can maintain a stage of 2 to 3 feet on the United States Engineer gauge at St. Paul, a saving can be made in the item St. Paul to Lake Pepin of about \$250,000.

If the water power scheme is carried out at Keokuk, there will be a saving in the Des Moines Rapids item of \$320,000.

If the 14-foot project for improvement from the Illinois River to St. Louis is adopted and carried out, there will be a saving of \$350,000.

The care and maintenance of the entire improvement after completion is estimated to cost \$300,000 per annum (including the canals).

#### GENERAL IMPROVEMENT.

*St. Paul to Winona, 116 miles.*—This division is in local charge of Assistant Engineer J. D. DuShane. By hired labor and use of Government plant work was carried on in 1906 at Beef Slough bar above Alma (miles 86–88 from St. Paul). Nine wing and trailing dams were built, and three wingdams were repaired and lengthened. Several pieces of shore protection were repaired.

In the above-mentioned work 14,788.3 cubic yards rock and 25,966.7 cubic yards brush were put in place, at a cost of \$0.98 per cubic yard, including superintendence, office expenses, and plant charges.

Suction dredge *Geyser* was employed from August 17 to October 10, 1906, in cutting a channel through Beef Slough bar. The area covered by the dredge was 376,900 square feet, the material consisting of sand and gravel, with some mill refuse, 65,589 cubic yards, the grade  $4\frac{1}{2}$  to 6 feet below low water, and the cost, including all charges, \$4,194.32, or 6.4 cents per cubic yard.

Eighty-one buoys were placed to mark the ends of dams near the channel. Mr. DuShane in his season report says:

The opening of the season found the way clear for the improvement of the channel at Beef Slough bar, which has for years been a very troublesome place for boats, but which could not be fully improved, owing to the use of the river

and sloughs in that vicinity for log-rafting works during the previous fifteen years or more. Log rafting in this part of the river (logs from Chippewa River) was finished in 1905; all logs hereafter coming down the Mississippi will come in rafts from the St. Croix and from above St. Paul. \* \* \*

As a means of improvement, the channel width was reduced from 800 to 600 feet, the old dams being extended and raised to grade, and new intermediate dams being built. \* \* \*

Much good was accomplished by the above work, but considerable further work is needed in this vicinity and should be the first undertaken during the coming season. \* \* \*

High water again interfered with procuring brush, making it necessary to go out of the district—to Brownsville and Genoa, 70 to 80 miles from the work—for some of the brush used. For this reason it is becoming more urgent each season that winter brush be secured.

*Winona to Wisconsin River, 96 miles.*—This division is in local charge of Assistant Engineer W. A. Thompson, and all work was done by hired labor and use of Government plant. Operations were carried on in 1906 in vicinity of Blacksmith Island (mile 123) and River Junction (mile 142). Seven wing and closing dams were built, and 2,800 linear feet of shore protection. Six dams were raised, extended, and repaired.

There were put in place 15,172.9 cubic yards rock and 29,713.5 cubic yards brush, at a cost of \$0.944 per cubic yard, including all charges. The rock used in the work was furnished by the United States quarry at La Moille, at a cost of \$0.782 per cubic yard loaded on barges.

Dipper dredge *Phoenix*, with single crew, was employed from September 7 to October 26 in removing the obstructing end of three wing dams near River Junction.

Sounding surveys were made from Cottage Island to the railway bridge at North La Crosse (3 miles), from Blacksmith Island to Island 76 (2 miles), and from Island 115 to head of Coon Slough (3 miles).

Thirty buoys were placed to mark the ends of dams near the channel.

Mr. Thompson says in his report:

Labor was scarce throughout the season and much trouble was experienced in securing sufficient help to operate the plant. \* \* \* The short season made a favorable showing impossible, on account of the large fixed charges, such as plant, rent, superintendence, etc., which can only be reduced to the minimum by working to full capacity during long seasons.

*Wisconsin River to Savanna, 95 miles.*—This division is in local charge of Assistant Engineer S. Edwards. Eight wing dams were built and four repaired and extended. This work was in or near Guttenberg channel (miles 225-234).

There were put in place 11,844.4 cubic yards rock and 21,065.9 cubic yards brush, at a cost, including all charges, of \$0.846 per cubic yard.

Suction dredge *Geyser*, with single crew, was employed from July 11 to August 8, 1906, at Parsons Bar (mile 256) and Eagle Point (mile 262). The quantity of sand removed at these localities was approximately 47,362 cubic yards, at a cost, including all charges, of \$3,004.60, or 6.3 cents per cubic yard.

Dipper dredge *Phoenix* was engaged from October 29 to November 6 in removing obstructing Dam 15, Guttenberg channel.

Surveys were made in Guttenberg channel (8½ miles), at Parsons bar (2 miles), and at Eagle Point (2 miles). Mr. Edwards says:

The small amount of work performed was due to a very short season, brought on by the continued high stage of water in the river and scarcity of labor, though quantity of material handled per man compares favorably with other seasons.

*Savanna to Rock Island, 56 miles.*—This division is in local charge of Assistant Engineer J. C. McElherne. Work in building dams and shore protections was carried on under contract with A. J. Whitney, in vicinity of Savanna (miles 308–309), until the completion of his contract, which was begun in 1905. One closing dam and one wing dam were built and 1,410 linear feet of shore protection. One wing was lengthened 300 feet.

There were put in place 6,185.4 cubic yards rock and 8,781.5 cubic yards brush, at a cost, including all charges, of \$0.894.

At the Rock Island Rapids (miles 348–364) some loose rock (247 cubic yards), broken by blasting in previous years, was removed by dredge *Vulcan*, and a few high points were reduced by means of the drill boat. This work was done at Sycamore and Campbells chains. A small amount of similar work at various chains remains to complete the improvement of the rapids under the existing 4-foot project.

The buoys of the system, to the number of 42, were reset in June and taken up in November, 1906. The cost of buoyage for the season was \$360.

*Rock Island to Burlington, 79 miles.*—This division is in local charge of Principal Assistant Engineer C. W. Durham. No construction work was done in 1906.

Buoys, 13 in number, were placed at ends of certain dams that are dangerous to raft navigation.

*Burlington to Hannibal, 98 miles.*—This division, which includes the Des Moines Rapids Canal, is in local charge of United States Civil Engineer M. Meigs. Work in this division consisted in the completion of a wing dam at Curtis Point (mile 501) by hired labor and use of Government plant.

There were put in place 4,683.3 cubic yards rock and 8,024.7 cubic yards brush, at a cost, including all charges, of \$1,045 per cubic yard.

A survey was made in vicinity of Curtis Point (miles 500–502) in June, 1906, and in November an inspection of all existing dams and shore protections throughout this division.

*Hannibal to Missouri River, 118 miles.*—This division is in local charge of Assistant Engineer A. L. Richards, and work was performed by hired labor and use of Government plant at vicinity of Portage Island (mile 642) and vicinity of Piasa Island (mile 646). Two dams were raised and repaired and the shore protection on Little Piasa Island was repaired.

There were put in place 9,316 cubic yards rock and 6,542.7 cubic yards brush, at a cost, including all charges, of \$1.281 per cubic yard.

Mr. Richards says:

The localities needing attention next season are the following: Gilbert Island, Kriders Island, Clarksville, Cap au Gris to Culvre River, and between Grafton and mouth of Missouri River. At the present time there is no available winter harbor for the fleet of this division. Quincy Bay is the nearest suitable, and it is 18 miles above the upper end. It is considered to be economical and desirable to winter the fleet at some point in the division, and a harbor should be estab-

lished either at Portage Island or Alton Slough. Either of these places can be converted into an excellent and safe harbor by the expenditure of a small amount in dredging their entrances.

There has been expended on the plant belonging to general improvement to December 31, 1906, \$1,093,790.66, and its estimated value on January 1, 1907, was \$158,708.46.

*Summary showing localities, amounts, and cost of regular construction works in 1907, between St. Paul and mouth of Missouri River.*

Method and locality.	Material.			Cost of work.	Average cost per cubic yard on barges.	Average cost per cubic yard for towing.	Average cost per cubic yard for putting in place.	Average cost per cubic yard for general superintendent's office, expenses, and inspection.	Average cost per cubic yard for local superintendent.	Average cost per cubic yard for plant.	Average cost per cubic yard in place.
	Rock.	Brush.	Total.								
<i>Hired labor.</i>	<i>Cu. yds.</i>	<i>Cu. yds.</i>	<i>Cu. yds.</i>								
St. Paul to Winona.	14,788.3	25,966.7	40,755.0	\$39,983.99	\$0.373	\$0.182	\$0.195	\$0.065	\$0.070	\$0.095	\$0.980
Winona to Wisconsin River	15,172.9	29,713.5	44,886.4	42,390.90	.320	.152	.184	.073	.066	.149	.944
Wisconsin River to Savanna.	11,844.4	21,065.9	32,910.3	27,843.92	.337	.124	.146	.061	.071	.107	.846
Burlington to Hannibal	4,683.3	8,024.7	12,708.0	13,284.07	.392	.193	.179	.074	.078	.129	1.045
Hannibal to Missouri River	9,316.0	6,542.7	15,858.7	20,329.07	.437	.201	.246	.089	.096	.212	1.281
<i>Contract.</i>											
Savanna to Le Claire, <sup>a</sup> 1905	12,907.8	22,485.3	35,393.1	31,630.70	.....	.....	.....	.099	.....	.....	.894
	68,712.7	113,798.8	182,511.5	175,462.65	.....	.....	.....	.....	.....	.....	.961

<sup>a</sup> Entire contract.

#### SPECIAL WORK.

*Warsaw to Quincy levee.*—In local charge of United States Civil Engineer M. Meigs.

#### ALLOTMENTS.

By sundry civil act approved—

March 2, 1895.....\$85,500.00

June 4, 1897.....5,000.00

March 3, 1899.....5,000.00

By river and harbor act approved June 13, 1902.....10,000.00

Total.....105,500.00

Balance unexpended July 1, 1907.....4,071.97

*Flint Creek to Iowa River levee.*—In charge of Principal Assistant Engineer C. W. Durham. No work was done during the past year. There is a small balance remaining to the credit of this work, which is being held for emergencies.

## ALLOTMENTS.

By sundry civil act of—

March 2, 1895.....	\$85,000.00
June 3, 1896.....	75,000.00
June 4, 1897.....	50,000.00
July 1, 1898.....	40,000.00

Total.....	300,000.00
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Balance unexpended July 1, 1907.....	443.52
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*Bar at Quincy.*—In local charge of United States Civil Engineer M. Meigs. Early in May a survey of the locality was made. From August 24 to October 12, 1906, suction-dredge *Hecla* was employed in removing sand and mud from the bar and depositing it behind the riprap dam (No. 21) built in 1904. Two cuts were made, 90 feet wide and about 1,200 feet long, and to a depth of about 10 feet below low water. The area covered by the dredge was 248,150 square feet; the material dredged, 135,837 cubic yards; the cost per cubic yard, 5 cents, including all charges.

## ALLOTMENTS.

By river and harbor act of June 30, 1896.....	\$10,000.00
By sundry civil act of March 3, 1899.....	10,000.00
By river and harbor act of June 13, 1902.....	20,000.00

Total.....	40,000.00
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Balance unexpended July 1, 1907.....	662.65
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*Harbor of Refuge below Davenport, Iowa.*—In local charge of Principal Assistant Engineer C. W. Durham. No work was done during the past year.

## ALLOTMENTS.

By sundry civil act of March 3, 1899.....	\$10,000.00
By river and harbor act of June 13, 1902.....	5,000.00

Total.....	15,000.00
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Balance unexpended July 1, 1907.....	1,953.20
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*Channel at Clinton, Iowa.*—In local charge of Assistant Engineer S. Edwards. During the year two wing dams were built from the Illinois shore above Lyons bridge to prevent the movement of the sand bar downstream. These dams, built to a 4-foot crest elevation, are 800 and 500 feet in length.

## ALLOTMENT.

By sundry civil act of March 3, 1899.....	\$25,000.00
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Balance unexpended July 1, 1907.....	2,126.67
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*Channel and Harbor at Hannibal, Mo.*—In local charge of Assistant Engineer A. L. Richards. No work was done during the past year.

## ALLOTMENT.

By river and harbor act of June 13, 1902.....	\$15,000.00
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Balance unexpended July 1, 1907.....	237.33
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*Harbor at Muscatine, Iowa.*—In local charge of Principal Assistant Engineer C. W. Durham. During the year harbor lines were established and a small amount of dredging was done.

## APPROPRIATIONS AND ALLOTMENTS.

By river and harbor act of—	
March 3, 1879	\$7,500.00
June 14, 1880	7,500.00
March 3, 1881	2,500.00
August 2, 1882	2,500.00
By sunry civil act of June 4, 1897	15,000.00
By river and harbor act of June 13, 1902	10,000.00
Total	45,000.00
Balance unexpended July 1, 1907	9,456.08

*Harbor of Refuge at Pepin, Wis.*—In local charge of Assistant Engineer J. D. DuShane. No work was done during the past year.

## ALLOTMENTS.

By river and harbor act approved—	
June 13, 1902	\$14,000.00
March 3, 1905	11,500.00
Total	25,500.00
Balance unexpended July 1, 1907	4,945.34

*Summary of expenditures for calendar year ending December 31, 1906, for improving Mississippi River from mouth of Missouri River to St. Paul, Minn.*

St. Paul to Winona, hired labor	\$35,960.96
Winona to Wisconsin River, hired labor	44,529.80
Wisconsin River to Le Claire, hired labor	27,281.80
Rock Island Rapids, hired labor	2,725.60
Rock Island to Montrose, hired labor	303.29
Keokuk to Hannibal, hired labor	11,637.09
Hannibal to Missouri River, hired labor	16,957.81
Savannah to Le Claire, contract 1905	14,582.73
Clarksville to Cap au Gris, contract 1905	13.08
Surveys and gauges	4,088.70
Construction, care, and repair of plant	26,367.70
Channel and harbor at Hannibal	100.98
Bar at Quincy	5,291.34
Harbor at Muscatine	167.51
Total	190,008.39

NOTE.—In above statement the retained percentage on contracts December 31, 1905, is deducted.

*Money statement.*

July 1, 1906, balance unexpended.....	\$432,845.97
Amount appropriated by river and harbor act approved March 2, 1907.....	500,000.00
	932,845.97
June 30, 1907, amount expended during fiscal year:	
For works of improvement.....	\$189,415.79
For maintenance of improvement.....	30,000.00
	219,415.79
July 1, 1907, balance unexpended.....	713,430.18
July 1, 1907, outstanding liabilities.....	38,000.00
	675,430.18
July 1, 1907, balance available.....	675,430.18
Amount (estimated) required for completion of existing project..	19,500,000.00
Amount that can be profitably expended in fiscal year ending June 30, 1909, for works of improvement, in addition to the balance unexpended July 1, 1907.....	
Submitted in compliance with requirements of sundry civil act of June 4, 1897.	
	1,000,000.00

*Net expenditures on various sections of the river, harbors, levees, etc., between Minneapolis and the Missouri River, from commencement of improvement to June 30, 1907.*

Locality.	Distance.	Amount.	Per mile.
	<i>Miles.</i>		
St. Paul to Minneapolis.....		\$59,113.46	
St. Paul to Prescott.....	80	671,798.35	\$22,398
Prescott to Lake Pepin.....	26	838,219.92	13,008
Foot of Lake Pepin to Alma.....	11	519,247.77	47,204
Alma to Winona Bridge (Chicago and Northwestern).....	28	790,102.76	28,218
Winona Bridge to La Crosse Bridge (Chicago, Milwaukee and St. Paul).....	28	865,860.46	30,924
La Crosse Bridge to McGregor Bridge.....	64	667,672.80	10,437
McGregor Bridge to Dubuque Bridge (Illinois Central).....	57	523,278.43	9,180
Dubuque Bridge to Clinton Bridge (Chicago and Northwestern).....	62	467,268.48	7,536
Clinton Bridge to Le Claire.....	21	89,880.24	1,897
Rock Island Rapids.....	14	672,866.86	48,061
Rock Island Bridge to Keithsburg Bridge.....	56	877,859.20	6,870
Keithsburg Bridge to Nashville.....	59	934,356.20	15,837
Keokuk Bridge to Quincy Bridge.....	37	618,024.12	16,708
Quincy Bridge to Clarksville.....	56	1,086,961.96	19,410
Clarksville to Cap au Gris.....	37	915,199.56	24,735
Cap au Gris to Illinois River.....	24	441,582.26	18,399
Illinois River to Missouri River.....	23	467,485.96	20,325
Dredging at various harbors.....		20,554.66	
Harbor of refuge at Pepin.....		15,770.65	
Ice harbor at Dubuque.....		22,678.33	
Channel and harbor at Clinton.....		13,046.80	
Harbor of refuge at Davenport.....		15,543.92	
Harbor at Muscatine.....		26,156.87	
Bar at Quincy.....		14,782.67	
Channel and harbor at Hannibal.....		299,556.48	
Flint Creek to Iowa River levee.....		101,428.08	
Warsaw to Quincy levee.....		496,595.71	
Various harbors, bays, channels, and levees.....		247,948.60	
Surveys, gauges, and meter work.....		159,733.76	
Plant at estimated value.....			
Total.....		11,896,772.55	

\* The amounts expended at each harbor, bay, etc., under this appropriation, as also additional amounts under special appropriations, are given in Report of Chief of Engineers for 1906, page 1617.

## APPROPRIATIONS.

## St. Paul to Des Moines Rapids:

By act approved—	
June 18, 1878.....	\$250,000.00
March 3, 1879.....	100,000.00
June 14, 1880.....	150,000.00
March 3, 1881.....	200,000.00
By act passed August 2, 1882.....	250,000.00
By act approved—	
July 5, 1884 (general improvement).....	250,000.00
July 5, 1884 (applied to harbor, Lake City).....	15,000.00
August 5, 1886.....	382,500.00

## Minneapolis to Des Moines Rapids:

By act of August 11, 1888.....	600,000.00
By act of September 19, 1890.....	500,000.00

## Des Moines Rapids to Illinois River:

By act approved—	
June 18, 1878.....	100,000.00
March 3, 1879.....	40,000.00
June 14, 1880.....	100,000.00
March 3, 1881.....	175,000.00
By act passed August 2, 1882.....	200,000.00
By act approved—	
July 5, 1884.....	200,000.00
August 5, 1886.....	150,000.00
By act of August 11, 1888.....	200,000.00
By act of September 19, 1890.....	165,000.00

## Ohio River to Minneapolis, applied to "between Missouri River and Minneapolis:"

By act approved—	
July 13, 1892.....	600,000.00
March 3, 1893 (sundry civil).....	866,666.67
August 18, 1894 (sundry civil).....	866,666.67
March 2, 1895 (sundry civil).....	866,666.67

## Ohio River to St. Paul, applied to "between Missouri River and St. Paul:"

By act of June 3, 1896.....	200,000.00
By act of June 4, 1897 (sundry civil).....	826,666.67
By act of July 19, 1897 (deficiency).....	200,000.00
By act of July 1, 1898 (sundry civil).....	826,666.67
By act of March 3, 1899 (sundry civil).....	826,666.67
By act of June 6, 1900 (allotment).....	150,000.00

## Missouri River to St. Paul:

By act approved—	
June 13, 1902.....	400,000.00
March 3, 1903 (sundry civil).....	400,000.00
April 28, 1904 (sundry civil).....	400,000.00
March 3, 1905 (sundry civil).....	400,000.00
June 30, 1906 (sundry civil).....	300,000.00
March 2, 1907 (Missouri River to Minneapolis).....	500,000.00

Total .....	12,657,500.02
Less amount transferred to work at Lock and Dam No. 2, Mississippi River, between Minneapolis and St. Paul (act August 18, 1894) .....	49,877.67

Received from sale of property.....	12,607,622.35
	1,580.38
	12,609,202.73

## Z 3.

## OPERATING AND CARE OF DES MOINES RAPIDS CANAL AND DRY DOCK.

The Des Moines Rapids Canal was in use from July 1 to November 21, 1906, and from March 18 to June 30, 1907, a period of 249 days. The dry dock was in constant use during the entire fiscal year.

United States Civil Engineer M. Meigs, who is in local charge of the canal, says in his annual report:

The stage of water has been above the average during the greater part of the year, nearly all the rafts, 24 in number, passing over the rapids and not appearing in the traffic statement. In like manner a large proportion of the packets and excursion boats have passed down outside of the canal. The traffic statement, notwithstanding this deflection, shows a material increase over that of last year. March 18 is the earliest opening of the canal on record, the season being at least three weeks in advance of ordinary years.

## REPAIRS TO LOCKS, ETC.

Nominal repairs were made to the gates of the guard, middle and lower locks, and to those of the dry dock. An inspection of the Sandusky sluice and some temporary repairs were made.

## DREDGING.

Dredging with suction dredge *Hecla* and double crew was carried on from July 5 to August 3, 1906, and from March 27 to the close of the fiscal year. The *Hecla* removed from the canal during the year 146,040 cubic yards of mixed material, principally at Prices Creek, vicinity of Sandusky, and below the guard lock. \* \* \* No real gain on the deposits has been attained, and it may be said that the canal as a whole is not so clear of deposits in 1907 as it was in 1882. Each heavy rain brings more deposit into the canal than formerly, and increased dredging is required to keep the channel open. \* \* \* The aggregate of material taken from the canal by dredging since June 30, 1878, is 2,327,783 cubic yards.

## PIERS ON DES MOINES RAPIDS.

Considerable repairs, amounting in some cases to rebuilding, were made to the piers on the rapids between the guard lock and Montrose.

## MACHINE SHOP.

At the machine shop at lower lock nominal repairs were made to lock machinery and to that of several towboats and dredges.

## DRY DOCK.

A large number of boats and barges, chiefly belonging to the United States, were repaired at the dry dock during the year.

## APPROPRIATIONS AND ALLOTMENTS.

By act approved—	
April 30, 1878.....	\$7,500.00
June 18, 1878 (allotment).....	32,500.00
March 3, 1879.....	40,000.00
June 14, 1880.....	30,000.00
March 3, 1881, expended during fiscal year ending—	
June 30, 1882....	41,771.17
June 30, 1883....	77,926.79
June 30, 1884....	43,283.42
July 5, 1884, expended during fiscal year ending—	
June 30, 1885....	44,506.50
June 30, 1886....	43,009.53
June 30, 1887....	42,152.84
June 30, 1888....	42,802.35
June 30, 1889....	38,885.37
June 30, 1890....	43,995.80
June 30, 1891....	44,998.20

By act approved—	
July 5, 1884, expended during fiscal year ending—	
June 30, 1892....	\$43,968.92
June 30, 1893....	57,057.21
June 30, 1894....	55,356.48
June 30, 1895....	41,052.80
June 30, 1896....	37,555.21
June 30, 1897....	33,440.54
June 30, 1898....	38,504.95
June 30, 1899....	35,118.85
June 30, 1900....	39,120.73
June 30, 1901....	48,595.91
June 30, 1902....	41,805.50
June 30, 1903....	40,623.37
June 30, 1904....	45,161.69
June 30, 1905....	43,668.83
June 30, 1906....	49,948.65
June 30, 1907....	37,698.97

Total expended 1,262,010.58

*Expenditures for operating and care of Des Moines Rapids Canal for fiscal year ending June 30, 1907.*

Month.	Office and administration.				Canal and locks.			
	Salaries.	Supplies.	Miscellaneous.	Total.	Labor.	Supplies.	Current repairs.	Total.
1906.								
July.....	\$425.00			\$425.00		\$74.70	\$2.40	\$77.10
August.....	506.00	\$34.70	\$18.76	558.46	\$1,820.00	82.20	129.20	1,931.40
September.....	425.00			425.00	1,820.00	409.92	210.93	1,940.85
October.....	425.00		182.80	567.80	2,600.00	25.35	729.65	3,355.00
November.....	506.00		12.75	517.75	1,584.67	182.48	608.80	2,320.95
December.....	506.00	86.59	52.53	644.12	855.50	82.88	513.54	1,401.92
1907.								
January.....	880.00	2.00	19.00	851.00	745.00	58.07		808.07
February.....	506.00			505.00	859.08	10.25	59.89	929.17
March.....	506.00			505.00	1,108.49	.40	63.69	1,167.58
April.....	506.00			505.00	1,400.50	85.11	34.08	1,519.69
May.....	425.00		18.41	443.41	1,895.00	758.81	65.78	2,219.59
June.....	425.00			425.00	1,414.65	228.42	387.62	1,980.69
Total.....	5,985.00	128.29	254.25	6,362.54	14,547.84	1,948.59	2,750.58	19,247.01

Month.	Dredging canal.				Grand total.
	Labor.	Supplies.	Current repairs.	Total.	
1906.					
July.....	\$1,107.63	\$325.40	\$1.18	\$1,434.16	\$1,986.28
August.....	70.66	511.48	45.80	627.94	2,717.80
September.....	1.67	247.44	170.81	419.92	2,786.77
October.....			29.48	29.48	3,942.23
November.....	30.09		415.93	446.02	3,284.72
December.....	300.00		378.91	678.91	2,719.96
1907.					
January.....		52.68	254.95	307.63	1,961.70
February.....	150.00		686.11	836.11	2,270.28
March.....	150.00	217.48	261.48	618.96	2,291.54
April.....	591.01	724.78	162.77	1,478.56	3,508.25
May.....	2,001.00	469.87	241.98	2,702.85	5,365.85
June.....	898.88	1,278.98	341.07	2,518.93	4,919.62
Total.....	5,300.94	3,818.11	2,975.37	12,094.42	37,608.97

## COMMERCIAL STATISTICS.

*Traffic statement of the Des Moines Rapids Canal for the fiscal year ending June 30, 1907.*

Month.	Boats up.	Boats down.	Barges up and down.	Passengers.	Merchandise.	Grain.
					Tons.	Bushels.
July..... 1906.	92	51	15	13,992	2,074	4,355
August.....	94	83	21	14,445	8,267	1,700
September.....	71	73	6	5,992	1,327	1,691
October.....	61	61	10	3,752	1,289	.....
November.....	30	40	7	841	586	.....
March..... 1907.	15	19	21	99	175	.....
April.....	54	13	14	240	172	.....
May.....	69	42	32	1,088	1,967	4,525
June.....	92	39	18	8,876	2,682	.....
Total.....	578	421	144	48,825	13,489	12,271

Month.	Lumber.	Logs.	Laths.	Shingles.	Lockages at one lock.
	Feet.	Feet.	Number.	Number.	
July..... 1906.					152
August.....	2,400,000	1,500,000	2,200,000	100,000	216
September.....	3,000,000	1,750,000	1,000,000	200,000	178
October.....	1,958,000	1,750,000	1,082,000	1,000,000	213
November.....		1,700,000			101
March..... 1907.					49
April.....					88
May.....					124
June.....					131
Total.....	7,358,000	6,700,000	4,282,000	1,300,000	1,252

## Z 4.

## IMPROVEMENT OF MISSISSIPPI RIVER AT MOLINE, ILLINOIS.

For statement of the approved project, see page 495 of this report.

The amount expended during the year was used for rock excavation in the upper and lower approaches to the lock in the building of the dam and back fills and in the construction of the lock and its appurtenances.

The lock construction was in local charge of Junior Engineer J. B. Bassett; the remainder of the work was in charge of Assistant Engineer J. C. McElherne. The lock, now nearly completed, was built under continuous contract with the Dravo Contracting Company, of Pittsburg, Pa.

During the year there were 15,686 solid cubic yards of rock broken up by blasting in the approaches, of which 5,817 cubic yards were in the lower approach. The total quantity broken up to date is 25,635 cubic yards, at an average cost, exclusive of plant charges, of \$2.44 per solid cubic yard. Dredging of the broken rock continued during the year; the quantity so dredged, measured as riprap, was 37,098 cubic yards, the total to date 43,831 cubic yards, and the average cost 46.2 cents per cubic yard. In the dam connecting Benhams Island and the lock there have been put in to date 56,290 cubic yards

of sand and broken rock, and in the north back fill 6,392 cubic yards. All of the rock so used was obtained from the approaches, the cost of which was charged to rock excavation. The average cost of putting the material in the dam is 19.4 cents per cubic yard, and in the back fill 16.6 cents, a boom dredge being used in handling the material from barges in both cases. In building, repairing, and strengthening the long dike running upstream from head of Benhams Island there has been used of the broken rock from the upper approach 19,730 cubic yards, at an average cost of 15½ cents per cubic yard, which was charged to rock excavation.

As regards the lock, the pit excavation has been nearly completed, the quantity of rock so far removed amounting to 10,080 cubic yards, of which, being mostly of good quality, there were used in the concrete 9,188 cubic yards. There remain about 300 cubic yards of trimming to complete this part of the work. An additional quantity of rock for making concrete (1,565 cubic yards) was purchased by the contractors.

The concrete is finished with the exception of about 70 cubic yards, the main, miter, and breast walls being completed. The quantity of concrete put in place to date is 11,230 cubic yards. The timbers for the lock gates have been framed ready for assembling, and the greater part of the fittings, valves, spars, motors, etc., has been received.

It is expected that the lock can be opened to navigation in November, 1907.

#### *Money statement.*

July 1, 1906, balance unexpended.....	\$193,754.95
Amount appropriated by sundry civil act approved March 4, 1907..	136,000.00
	<hr/>
	329,754.95
June 30, 1907, amount expended during fiscal year, for works of improvement.....	179,107.24
	<hr/>
July 1, 1907, balance unexpended.....	150,647.71
July 1, 1907, outstanding liabilities.....	31,084.18
	<hr/>
July 1, 1907, balance available.....	119,563.53
	<hr/>
July 1, 1907, amount covered by uncompleted contracts.....	41,475.13

#### APPROPRIATIONS.

By act approved—	
March 3, 1905.....	\$100,000
June 30, 1906.....	150,000
March 4, 1907.....	136,000
	<hr/>
Total.....	386,000

#### CONTRACT IN FORCE.

1. With the Dravo Contracting Company, of Pittsburg, Pa., for construction of lock at Moline, Ill. Contract is dated March 31, 1906, approved April 12, 1906, work to be begun within thirty days after receipt by said company of its copy of the contract, duly approved, and to be completed on or before April 1, 1908.

## Z 5.

OPERATING AND CARE OF ILLINOIS AND MISSISSIPPI CANAL  
AROUND LOWER RAPIDS OF ROCK RIVER AT MILAN, ILLINOIS.

During the past fiscal year the canal was in operation from July 1 to November 20, 1906, and from March 19 to June 30, 1907, a period of 247 days, during 16 days of which lock 37 was flooded by back-water from the Mississippi River.

Repairs to locks, gates, buildings, etc., were nominal. The bank revetment in both levels was repaired where necessary, 2,080 cubic yards broken rock and gravel being used for the purpose. The repairs to the road at Silver Lake, begun in 1905, were completed. The boat yard at Silver Lake was graded by means of suction-dredge *Geyser*. The approaches to locks 35 and 37 were dredged by suction-dredge *Geyser* and dipper-dredge *Apache*, there being removed at and below lock 35, 1,559 cubic yards mud and sand, and below lock 37, 7,139 cubic yards. The total quantity of material dredged to date from canal and its approaches, 101,370 cubic yards. An examination of the outlet of Mill Creek and a portion of South Slough was made.

An attempt to cut brush as the initial step in clearing out deposits in South Slough was made by this office, but the men were arrested, and the matter is still in the courts awaiting settlement.

Two Taintor sluices in the dam above Mill Creek were broken by an ice gorge. The openings were bulkheaded and preparations made to repair or rebuild the gates.

The canal is in local charge of Assistant Engineer J. C. McElherne. There are no outstanding liabilities.

## ALLOTMENTS.

By act approved July 5, 1884, expended:

During fiscal year ending—		During fiscal year ending—	
June 30, 1895 -----	\$225. 00	June 30, 1903 -----	\$11, 398. 94
June 30, 1896 -----	5, 309. 17	June 30, 1904 -----	13, 198. 47
June 30, 1897 -----	4, 752. 46	June 30, 1905 -----	13, 601. 96
June 30, 1898 -----	4, 502. 39	June 30, 1906 -----	9, 694. 47
June 30, 1899 -----	3, 304. 92	June 30, 1907 -----	8, 423. 46
June 30, 1900 -----	5, 379. 84		
June 30, 1901 -----	4, 806. 18	Total -----	95, 642. 19
June 30, 1902 -----	11, 014. 93		



*Summary of expenditures for operating and care of western section Illinois and Mississippi Canal for fiscal year ending June 30, 1907.*

Month.	Superintendence, office expenses, supplies, engineering and contingencies.	Operating and care, locks and bridges.	Repairs.	Dredging.	Total.
<b>1906.</b>					
July .....	\$13.50	\$335.00			\$348.50
August .....	9.13		\$15.25		24.38
September .....	16.50	296.00		\$350.49	661.99
October .....	5.75	305.31	319.39		630.45
November .....	268.22	614.13	1,016.28	564.78	2,453.41
December .....	\$28.26	245.00			568.26
<b>1907.</b>					
January .....	.56	245.00	445.97		691.53
February .....	160.00	245.00	418.59		823.59
March .....	30.90	266.67	111.00	124.06	532.65
April .....	12.00	295.00	27.87	333.99	668.86
May .....		337.25	9.45	40.80	387.50
June .....	238.06	342.63	51.65		632.34
<b>Total .....</b>	<b>1,077.88</b>	<b>3,525.99</b>	<b>2,415.45</b>	<b>1,404.14</b>	<b>8,423.46</b>

## COMMERCIAL STATISTICS.

*Traffic statement of western section of Illinois and Mississippi Canal for the fiscal year ending June 30, 1907.*

Month.	Steamers.		Barges.		Number of passengers.	Tons of freight.	Lockages at three locks.
	Number.	Tons.	Number.	Tons.			
<b>1906.</b>							
July .....	110	748	11	217	612	16	233
August .....	106	1,485	20	1,650	632	51	220
September .....	96	653	16	1,665	439	54	217
October .....	86	2,212	79	13,960	115	2,131	213
November .....	39	1,403	63	8,641	2	857	102
<b>1907.</b>							
March .....	42	1,125	38	4,755	46	40	86
April .....	93	1,263	25	2,933	161	45	175
May .....	145	1,723	35	2,110	364	112	271
June .....	187	1,961	52	3,092	461	166	362
<b>Total .....</b>	<b>904</b>	<b>12,563</b>	<b>339</b>	<b>39,023</b>	<b>2,862</b>	<b>3,472</b>	<b>1,879</b>

NOTE.—The larger part of the traffic was by Government boats.

## Z 6.

ILLINOIS AND MISSISSIPPI CANAL—IMPROVEMENT OF ROCK RIVER POOL.

Rock River Pool extends from the vicinity of mouth of Green River (Lock 29) to the head of Rock River Rapids (Lock 35), a distance of about  $8\frac{1}{2}$  miles. In this length stretches, aggregating about 5 miles, did not afford a navigable depth of 7 feet, which is the depth afforded by the canal proper, and in a few places not more than 3 feet were found, the surface of the pool being supposed at an elevation of 131 feet, Hennepin datum, the established grade.

In 1902 a survey of Rock River Pool was made, and an estimate based on that survey for a channel 80 feet wide and 7 feet deep is \$69,000. A partial project involving an expenditure of \$20,000 was rendered and approved in December, 1906, this partial project covering the blasting and dredging of rock to 7 feet where rock existed above the 5-foot curve, and also the dredging of sand and gravel to 7 feet where no rock is met with before that depth is reached. In this manner a considerable portion of the work will be fully completed, but the minimum and ruling depth will be 5 feet.

On April 4, 1907, drill boat *103*, with double crew, was put at work blasting rock in vicinity of Lock 29, where she blasted a cut 80 feet wide, 7 feet deep, and 500 feet long, completing the blasting downstream to the 5-foot contour. She then went to head of Anderson Island and worked in the chute until May 15, finishing the proposed blasting. During the time mentioned she broke up 11,076 cubic yards rock in an area of 67,776 square feet and at a cost of 26.1 cents per cubic yard.

Suction dredge *Geyser* began operations April 9, 1907, in the crossing below Anderson Island, where she made a channel 80 feet wide, 7 feet deep, and about 800 feet long. She then worked in Anderson Island chute and above until May 31. In the chute she made 1,600 linear feet and above the island 1,200 feet of channel of above-named dimensions. She removed 32,080 cubic yards of sand at a cost of 4.6 cents per cubic yard.

Dipper dredge *Apache* commenced removing the broken rock in the chute April 22, 1907, and continued to June 30. She has removed 20,485 cubic yards broken rock, clay, gravel, and sand, at a cost of 21.3 cents per cubic yard. The *Apache* is still at work, and it is expected the project will be completed some time in September.

The amount expended during the year was \$9,886.73.

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## Z 7.

### OPERATING AND CARE OF GALENA RIVER IMPROVEMENT, ILLINOIS.

During the past fiscal year the lock was open to navigation from July 1 to November 20, 1906, and from March 1 to June 30, 1907, a period of 235 days, during 56 days of which it was flooded by back-water from the Mississippi River. Small repairs were made to lock, dam, and appurtenances, and a survey of the pool and Harris Slough was made. This survey showed that the dredging of about 29,247 cubic yards of mud and sand would be necessary to restore a 3-foot grade above the lock and in Harris Slough.

The improvement is in local charge of Assistant Engineer J. C. McElherne.

## APPROPRIATIONS AND ALLOTMENTS.

By act approved—

September 19, 1890, purchase of improvement.....	\$100,000.00
July 5, 1884, expended during fiscal year ending—	
June 30, 1894.....	635.68
June 30, 1895.....	6,000.00
June 30, 1896.....	3,400.00
June 30, 1897.....	8,588.20
June 30, 1898.....	5,890.05
June 30, 1899.....	3,226.87
June 30, 1900.....	8,750.94
June 30, 1901.....	12,077.01
June 30, 1902.....	9,166.68
June 30, 1903.....	2,937.27
June 30, 1904.....	2,916.49
June 30, 1905.....	3,833.28
June 30, 1906.....	2,679.91
June 30, 1907.....	2,805.06
Total.....	172,907.44

*Summary of expenditures for operating and care of Galena River improvement for fiscal year ending June 30, 1907.*

Month.	Superintendence, office expenses, incidental repairs, contingencies, and dredging.	Operating.		Repairs.	Total.
		Labor.	Supplies.		
1906.					
July .....		\$160.00			\$160.00
August .....					
September .....		160.00		\$84.00	244.00
October .....	\$55.00	160.00	\$16.03	82.00	268.03
November .....		320.00	27.55		347.55
December .....	255.00	120.00			375.00
1907.					
January .....		120.00			120.00
February .....	375.00	120.00	\$1.50		528.50
March .....		120.00			120.00
April .....		160.00		67.71	227.71
May .....		160.00	7.35		167.35
June .....	9.92	244.00			258.92
Total .....	694.92	1,844.00	82.43	183.71	2,806.06

## COMMERCIAL STATISTICS.

*Traffic statement of the Galena River improvement for the fiscal year ending June 30, 1907.*

Month.	Boats up and down.	Passengers.	Merchandise.	Lockages.
1906.				
July.....	551	3,314	Tons. 580	115
August.....	482	2,958	452	304
September.....	522	2,267	574	341
October.....	410	1,067	690	264
November.....	153	281	517	99
1907.				
March.....	11	82		
April.....	167	675	41	
May.....	373	1,073	755	285
June.....	462	878	569	320
Total.....	8,131	12,540	4,128	1,708



## APPENDIX A A.

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RESERVOIRS AT HEADWATERS OF MISSISSIPPI RIVER; IMPROVEMENT OF MISSISSIPPI RIVER FROM ST. PAUL TO MINNEAPOLIS, MINNESOTA; OF RIVERS IN WISCONSIN AND MINNESOTA TRIBUTARY TO THE MISSISSIPPI RIVER; OF WARROAD HARBOR AND RIVER, MINNESOTA, AND OF RED RIVER OF THE NORTH, MINNESOTA AND NORTH DAKOTA; GAUGING MISSISSIPPI RIVER AT ST. PAUL, MINNESOTA.

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REPORT OF CAPT. EDWARD H. SCHULZ, CORPS OF ENGINEERS, OFFICER IN CHARGE, FOR THE FISCAL YEAR ENDING JUNE 30, 1907.

### IMPROVEMENTS.

- |   |   |
|---|---|
| 1. Mississippi River between St. Paul and Minneapolis, Minnesota.   | 6. Red River of the North, Minnesota and North Dakota.  |
| 2. Reservoirs at headwaters of Mississippi River, and Mississippi River between Brainerd and Grand Rapids, Minnesota. | 7. Warroad Harbor and Warroad River, Minnesota.   |
| 3. Operating and care of reservoirs at headwaters of Mississippi River.   | 8. Survey of Otter Tail Lake and Otter Tail River and Red Lake and Red Lake River, Minnesota, and Big Stone Lake and Lake Traverse, Minnesota and South Dakota. |
| 4. St. Croix River, Wisconsin and Minnesota.  | 9. Gauging Mississippi River at or near St. Paul, Minnesota.  |
| 5. Minnesota River, Minnesota.  |   |
- 

UNITED STATES ENGINEER OFFICE,  
*St. Paul, Minn., July 1, 1907.*

GENERAL: I have the honor to submit herewith \* \* \* report upon the works of river and harbor improvement for this district during the fiscal year ending June 30, 1907.

Very respectfully, your obedient servant,

EDWARD H. SCHULZ,  
*Captain, Corps of Engineers.*

Brig. Gen. A. MACKENZIE,  
*Chief of Engineers, U. S. A.*

## A A 1.

## IMPROVEMENT OF MISSISSIPPI RIVER BETWEEN ST. PAUL AND MINNEAPOLIS, MINNESOTA.

The approved project will be found in the Report of the Chief of Engineers for 1907, Part 1, page 497.

## LOCK AND DAM NO. 2.

On July 9, 1906, the lock chamber was pumped out and the work of repairing the disrupted floor was commenced and finished in the fall. The repairs consisted in removing the old timber, constructing a cut-off wall some 10 feet deep across the chamber, a wing wall behind the land wall, filling in some 2,200 cubic yards of gravel, and placing 2,100 square yards of large paving stone. The ironwork, including the lower gate, was scraped and painted. In November the chamber was filled for the first time and the gates and walls tested. After being operated for a few weeks the lock was laid up for the winter. Early in the spring the upper coffer needles were removed, the gates tested, and, as far as this lock is concerned, navigation was open on the upper Mississippi early in April, 1907. The first power boat to pass through was the *Itura*, of Minneapolis, May 19, 1907. The site was cleared of the loose timber, piles, and other material used in construction and the same rafted and floated to Lock No. 1. The terrepleine, 60 feet wide, was covered with soil and planted with grass seed. Some changes were made in the pumping machinery.

## DAM NO. 2.

The dam is seemingly intact. In the progress of the work it was necessary to raise and lower the bear-trap sluice gates several times. These gates are built of timber, of the reversed Parker type, held in place mainly by chains provided with turnbuckles, terminating in rods or arms. There are 100 of these in each gate. Loose bolts on the surface of the lower leaf of both gates gave evidence that something was amiss and that repairs were necessary. Temporary cofferdams were built and the interior of the west gate pumped out. It was found that the gate rested upon a deposit, composed of river silt, gravel, bark, and sand, which held it about 2 feet above its normal position when down. The holding-down rods were practically all broken or badly bent. This had been caused by sediment collecting, which prevented the rods from falling as was intended. When the gate descended they were struck and broken or bent. This will undoubtedly happen in sediment-bearing streams whenever this type of holding-down device is used. No injury was apparent to the timber or hinges. The accompanying drawing<sup>a</sup> and two photographs illustrate the condition of the gate.

There were several methods of repair, more or less expensive. The one adopted was to replace the broken rods by chains. Only one gate, the west or inshore one, was repaired. High water prevented work

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<sup>a</sup> Not printed.

on the east gate, but there can be no reasonable doubt that the same conditions prevail in that gate also.

This type of gate should be so designed that the interior can be examined at any time and thoroughly flushed whenever necessary to remove the sediment.

Soundings were made along the dam both above and below; also above and below the sluice gate, and platted for comparison. One hundred and fifty cubic yards of large stone were placed immediately below the west sluice where scouring had occurred. General repairs were made to cableway and other machinery as necessary.

#### LOCK AND DAM NO. 1.

The lock cofferdam was pumped out early in July, 1906, and excavation for the land wall was resumed. On account of high water operations were suspended and the cofferdam was allowed to fill up August 5, 1906. Plans for lock No. 1 were submitted to the Chief of Engineers June 25, 1906, and referred to a board of engineer officers, consisting of Lieut. Col. W. L. Marshall, Maj. C. McD. Townsend, Maj. J. G. Warren, and Lieut. P. S. Bond.

New plans were prepared in accordance with the report of the board, and these, after modification, were approved April 6, 1907. During the interim the plant was installed, such portions of it as were available being brought down from Lock and Dam No. 2. The lock cofferdam was again pumped out April 23, 1907, and active operations resumed. At the close of the year the foundation of the land wall had been completed.

The work was under the immediate supervision of Mr. A. O. Powell, assistant engineer, until August 10, 1906, and Mr. George W. Freeman, assistant engineer, since that time.

#### *Statement of expenditures during the year.*

##### LOCK AND DAM NO. 2.

##### Lock floor:

Removing timber and paving with rock	\$3,611.70
Quarrying rock	1,133.25
Cut-off wall	1,427.35

\$6,172.30

Painting and repair of gates	515.32
Cleaning up	480.81
Protection against high water	260.71
Watching	956.51
Bear-trap sluice gates	531.26
Bear-trap sluice gates, repairs	2,792.43
Pumping	1,233.94
Coal	1,801.12
Oils	95.28

##### Cableway:

Operating	\$1,510.18
Repairs	268.51

1,778.69

##### Plant:

Purchase	523.73
Repairs	14.00

537.73

\$17,156.10

# 1580 REPORT OF THE CHIEF OF ENGINEERS, U. S. ARMY.

## LOCK AND DAM NO. 1.

Excavation .....	\$2, 118. 76
Roads, ditches, etc.....	73. 17
Sheet piling .....	426. 44
Material for dam.....	629. 91
Watching .....	848. 97
Installation of crusher plant, tracts, bins, etc.....	947. 22
Concrete:	
Mixing and placing.....	\$1, 031. 58
Cement .....	3, 732. 58
Sand .....	62. 85
Stone .....	4, 972. 33
Forms .....	2, 896. 00
	12, 695. 34
Pumping .....	1, 059. 30
Coal .....	2, 107. 50
Oils .....	113. 28
Plant:	
Purchase .....	\$3, 551. 45
Repairs .....	2, 372. 08
	5, 923. 53
Board of Engineers on Plans.....	401. 48
	<u>\$27, 344. 90</u>

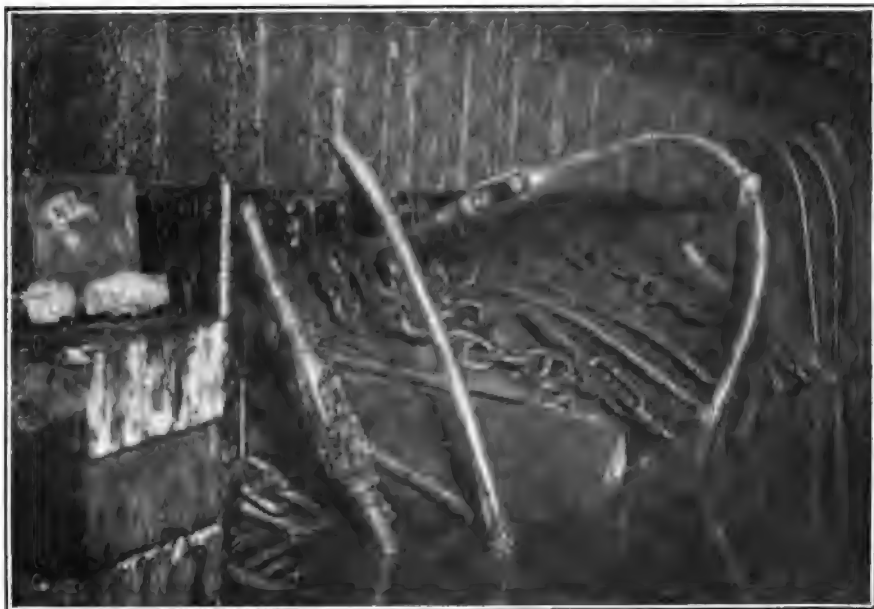
## SUPERINTENDENCE AND CONTINGENCIES.

Commission investigating water power.....	\$45. 50
Inspection .....	1, 060. 09
Lands, surveys, borings, etc.....	196. 72
St. Paul office.....	5, 432. 52
Total expenditures .....	<u>51, 235. 83</u>

## Money statement.

July 1, 1906, balance unexpended.....	\$315, 120. 02
Amount appropriated by sundry civil act approved March 4, 1907...	30, 000. 00
Amount derived from sales.....	13. 19
	<u>345, 133. 21</u>
June 30, 1907, amount expended during fiscal year:	
For works of improvement.....	\$48, 443. 40
For maintenance of improvement.....	2, 792. 43
	<u>51, 235. 83</u>
July 1, 1907, balance unexpended.....	293, 897. 38
July 1, 1907, outstanding liabilities.....	8, 870. 96
	<u>285, 026. 43</u>
July 1, 1907, balance available.....	<u>285, 026. 43</u>
July 1, 1907, amount covered by uncompleted contracts.....	5, 400. 00
Amount (estimated) required for completion of existing project...	<u>239, 543. 00</u>
<div> <div> Amount that can be profitably expended in fiscal year ending June 30, 1909, for works of improvement, in addition to the balance unexpended July 1, 1907..... </div> <div> Submitted in compliance with requirements of sundry civil act of June 4, 1897. </div> </div>	
	239, 543. 00





VIEW OF INTERIOR OF WEST BEAR TRAP SLUICE GATE AT LOCK AND DAM NO. 2, SHOWING DEPOSIT OF SILT AND CONDITION OF RODS ATTACHED TO THE UPPER HOLDING-DOWN CHAINS. TAKEN DECEMBER 12, 1906.



VIEW OF INTERIOR OF WEST BEAR TRAP SLUICE GATE AT LOCK AND DAM NO. 2, SHOWING DEPOSIT OF SILT AND CONDITION OF RODS ATTACHED TO THE LOWER HOLDING-DOWN CHAINS. TAKEN DECEMBER 27, 1906.



## APPROPRIATIONS.

August 18, 1894.....	\$51,000.00
July 13, 1892 (allotted by act of August 18, 1894).....	49,877.67
June 3, 1896.....	100,000.00
March 3, 1899.....	150,000.00
June 6, 1900.....	185,000.00
March 3, 1901.....	157,000.00
June 28, 1902.....	250,000.00
March 3, 1903.....	223,579.33
June 30, 1906.....	30,000.00
March 4, 1907.....	30,000.00
<b>Total</b> .....	<b>1,228,457.00</b>

*Receipts from sales.*

July 17, 1906.....	\$6.60
August 31, 1906.....	1.00
November 15, 1906.....	4.50
May 31, 1907.....	1.00
<b>Total</b> .....	<b>13.10</b>

## CONTRACT (EMERGENCY) IN FORCE.

Name.	Date.	For—	In effect.	Expires.
The General Fireproofing Co....	May 17, 1907.	150 tons steel bars ....	May 22, 1907.	July 21, 1907.

## COMMERCIAL STATISTICS.

The principal commerce over this part of the river is that of drifting about 75,000,000 feet B. M. of loose logs (about 300,000 tons) over the upper and middle sections and rafting the same with steamboats on the lower section. The estimated value of these logs was \$900,000.

The excursion business on the lower and middle sections amounted to about \$15,000. The river is also much used by numerous steam and naphtha pleasure boats.

## A A 2.

## CONSTRUCTION OF RESERVOIRS AT HEADWATERS OF MISSISSIPPI RIVER AND IMPROVEMENT OF MISSISSIPPI RIVER BETWEEN BRAINERD AND GRAND RAPIDS, MINNESOTA.

The approved project and report of progress of the work up to June 30, 1906, will be found in the Report of the Chief of Engineers for 1907, part 1, page 499.

The expenditures during the fiscal year were \$20,756.68.

## OPERATIONS DURING THE YEAR.

*Reconstruction of Pine River dam.*—The embankments abutting the masonry of the dam were completed; a small dike was built at the gauging station below the dam; the sluice gates were put in and stop plank hoist erected at log sluice; the concrete railing on upstream side of dam was completed; and the buildings and plant have been overhauled and put in good order.

*Reconstruction of Sandy Lake dam.*—Plans and specifications for a concrete dam, without a lock for steamboats, to replace the present timber dam and lock were prepared and proposals issued for the construction by contract of the portion now occupied by the dam proper. In view of the fact that considerable protest has been made against the elimination of the lock in the proposed new structure, the Chief of Engineers directed that the portion in which the lock is now located be left in its present condition until Congress shall have had an opportunity to consider the question of renewing the lock.

*Improving Mississippi River between Brainerd and Grand Rapids, Minn.*—Early in July, 1906, the snag boat, which had been laid up on account of high water, resumed operations about 7 miles below Aitkin, Minn., and worked downstream to near Brainerd, removing snags and other obstructions from the channel and overhanging trees from the banks of the river. The boat then worked upstream until early in November, when freezing weather set in, and the boat was laid up at Sandy Lake dam. The season's work was as follows:

One hundred and eleven miles of river was worked over.

One hundred and twenty-three cubic yards of bowlders removed.

Seven hundred and fifty-nine snags, 46,766 deadhead logs, and 122 stumps removed.

Twelve thousand four hundred and thirty-three overhanging trees and bushes removed.

The stage of water in the river has been too high to permit work being done to advantage during the season of 1907, but it is expected to resume operations early in July, 1907.

*Purchase of lands or easements.*—The fee title to or flowage right on 91 tracts, aggregating 517.29 acres, were acquired at from \$3 to \$5 per acre for fee title and from \$1 to \$3 for flowage right. This completed the lands or easements which could be acquired by direct negotiation with the owners, and condemnation proceedings have been inaugurated for the acquisition of the balance required. Of the latter, 139 tracts for flowage right, aggregating 1,195 acres, and 7 tracts for fee title, aggregating 24 acres, have been examined and appraised by commissioners, but the award has not yet been confirmed. There still remain 770 tracts, aggregating 5,025 acres of flowage right, and 4 tracts, aggregating 44 acres of fee title, to be examined and appraised, but it is expected that the matter will be closed up before the end of the calendar year 1907.

The reconstruction of reservoirs and the improvement of the Mississippi River between Brainerd and Grand Rapids are under the direct supervision of Mr. Thomas Robinson, assistant engineer. The acquisition of lands and flowage easements is under the direct supervision of Mr. R. Davenport, assistant engineer.

The cost of the work accomplished during the year is shown in the following itemized statement:

Reconstruction of Pine River dam:

Abutments .....	\$1, 630. 28
Booms and piers .....	58. 13
Bridge .....	163. 31
Cofferdam .....	318. 61
Concrete .....	787. 89
Embankments .....	315. 35
Gauging station .....	114. 91
Inspection .....	152. 08
Plant .....	1, 290. 91
Removal of old dam .....	242. 06
Repairs to buildings .....	777. 10
Repairs to old foundations .....	289. 25
Riprapping .....	927. 35
Steelwork and gates .....	2, 592. 45
Telephone line from Pequot, Minn., to dam .....	42. 80
	<u>\$9, 702. 48</u>

Improving Mississippi River between Brainerd and Grand Rapids:

Plant .....	70. 62
Removal of obstructions .....	2, 757. 60
Inspection .....	52. 21
	<u>2, 880. 43</u>

Purchase of lands or easements:

Below Pokegama .....	2, 073. 24
Above Pokegama .....	2, 410. 08
	<u>4, 483. 32</u>

Administration and St. Paul office expenses .....

3, 690. 45

Total .....

20, 756. 68

*Money statement.*

July 1, 1906, balance unexpended .....	\$158, 815. 68
Amount appropriated by river and harbor act approved March 2, 1907 .....	145, 000. 00
Amount derived from sales .....	38. 65
	<u>303, 854. 33</u>
June 30, 1907, amount expended during fiscal year, for works of improvement .....	20, 756. 68
July 1, 1907, balance unexpended .....	283, 097. 65
July 1, 1907, outstanding liabilities .....	2, 453. 39
July 1, 1907, balance available .....	<u>280, 644. 26</u>
<p>{ Amount that can be profitably expended in fiscal year ending June 30, 1909, for works of improvement, in addition to the balance unexpended July 1, 1907 .....</p>	
<p>{ Submitted in compliance with requirements of sundry civil act of June 4, 1897. ....</p>	
	60, 000. 00

APPROPRIATIONS.

June 14, 1880 .....	\$75, 000	August 18, 1894 .....	\$51, 000
March 3, 1881 .....	150, 000	June 3, 1896 .....	80, 000
August 2, 1882 .....	300, 000	March 3, 1899 .....	210, 000
July 5, 1884 .....	60, 000	June 13, 1902 .....	250, 000
August 5, 1886 .....	37, 500	March 3, 1905 .....	160, 000
August 11, 1888 .....	12, 000	March 2, 1907 .....	145, 000
September 19, 1890 .....	80, 000		
July 13, 1892 .....	60, 000		
		Total .....	<u>1, 670, 500</u>

*Receipts from sales.*

July 17, 1906.....	\$0. 65
February 28, 1907.....	3. 00
June 15, 1907.....	35. 00
Total.....	38. 65

## COMMERCIAL STATISTICS.

*Mississippi River between Brainerd and Grand Rapids.*—The river business for the season of 1907 was carried by the steamer *Irene*, 30 tons, and steam barge *Atlas*, 400 tons, both of Aitkin, Minn., and several smaller boats ranging from 5 to 15 tons, owned at Brainerd and other places.

During the year these boats jointly carried 5,550 passengers, 11,900 tons of manufactured lumber, and 2,800 tons of farm products and general merchandise, having a total value of \$1,083,550.

About 410,000,000 feet B. M. of logs were drifted down this portion of the river. The weight of these logs was about 1,435,000 tons, and their value \$4,920,000.

In addition to loose logs, rafts of logs, railroad ties, cedar poles and posts were floated down, but the actual quantities could not be obtained.

## A A 3.

OPERATING AND CARE OF RESERVOIRS AT HEADWATERS OF  
MISSISSIPPI RIVER.

The approved project and report of progress of the work up to June 30, 1906, will be found in the Report of the Chief of Engineers for 1907, Part 1, page 502.

Winnibigoshish, Leech Lake, Pokegama, Sandy Lake, and Pine River reservoirs were in operation during the entire year.

It is endeavored to operate the reservoirs to the best advantage for the general welfare. Daily reports are received from each of them and from gauge stations along the river, and the orders to the dam tenders are changed from day to day to best meet the requirements of the situation. The reservoirs affect seven different interests which often conflict—steamboat navigation below St. Paul, steamboat navigation above St. Paul, logging, mills at Minneapolis, mills above Minneapolis, riparian owners on the river, and riparian owners on the reservoirs. It is impossible to so manage the reservoirs as to suit all concerned, because each party minimizes or ignores entirely the interests of all the others. The reservoirs are being so managed as to benefit, in the course of the year, every one of the seven interests concerned except the riparian owners on the reservoirs, who have been, or are being, compensated in cash. Each of these interests is materially better off than it would be if the reservoirs did not exist, but none are entirely satisfied, and some very much dissatisfied, because each would like the reservoirs managed exclusively for its own benefit, so that it might receive, if possible, all of the great public good which the reservoir system is intended to accomplish and does accomplish.

Without the reservoirs the discharge of the river at St. Paul is liable to fall to 1,500 cubic feet or less per second, as it has in the past, while with them the discharge can be readily held throughout the

navigation season at or above 6,000 cubic feet per second. The benefit to steamboat navigation at and below St. Paul is manifest from these figures.

This same increment to the low-water discharge produces a still greater effect above St. Paul throughout the 434 miles of navigable river between Minneapolis and Cass Lake. It is true that there are but few steamboats on the river above St. Paul at present, but it is mainly due to the fact that the logging industry is using this length of the river to its extreme capacity, making other forms of navigation impossible in many places. There are annually carried about 450,000,000 feet B. M. of logs, or 1,575,000 tons, a very heavy tonnage for so small a stream, largely due to the facilities offered by the reservoir system. The use of the reservoirs for the benefit of navigation also benefits the mills, though of course the benefit is not as great for any one mill as it would be if the reservoirs were used as mill ponds to equalize the available power for that mill. Recent acts of Congress have authorized the development of the water power of the Mississippi at seven new sites above Minneapolis in addition to the four dams that already existed.

During the past year necessary repairs were made to the various dam tender's quarters and to the telephone lines between Winnibigoshish and Leech Lake dams and Bena, Minn., between Sandy Lake dam and McGregor, Minn., and between Pine River dam and Pequot, Minn. At Leech Lake dam the repairs begun on the earthen embankment of the dam last year were continued, 5,239 cubic yards of sand being put on. The river bed below the log sluice was protected from further erosion by the extension of the sluice piers to the edge of the apron, a distance of 26 feet, and the construction of a flume 12 feet wide, 3 feet deep, and 100 feet long, carried on piles downstream from the apron.

The following is a brief statement of the liabilities incurred during the year:

Operation and minor repairs to dams and quarters.....	\$8,138.15
Repairs to embankment of Winnibigoshish dam.....	400.32
Repairs to Leech Lake dam embankment.....	2,238.71
Hydrological expenses.....	283.65
Administration, etc.....	4,051.73
<b>Total.....</b>	<b>15,112.56</b>

The following table shows the discharge and difference in storage for the year June 30, 1906, to June 30, 1907:

Reservoir.	Gauge in lake.			Average discharge per second.	Total storage June 30, 1907.	Increase (+) or decrease (-) in storage since June 30, 1906.
	Standard high-water flowage line.	June 30, 1906.	June 30, 1907.			
				<i>Cubic feet.</i>	<i>Cubic feet.</i>	<i>Cubic feet.</i>
Lake Winnibigoshish.....	14.20	18.08	12.50	549	36,628,400,000	-2,656,362,000
Leech Lake.....	5.74	8.65	8.80	295	20,964,020,000	+ 889,560,000
Pokegama.....	12.00	12.66	11.10	1,611	4,869,000,000	-1,710,000,000
Pine River.....	18.50	9.15	12.30	376	8,872,920,000	+1,777,600,000
Sandy Lake.....	11.00	11.71	5.30	871	969,780,000	-2,536,151,000
<b>Total.....</b>					<b>66,794,120,000</b>	<b>-4,285,358,000</b>

\* The water from these two reservoirs passes through Pokegama reservoir. Total average discharge from Pokegama, Pine, and Sandy lakes, 2,358 cubic feet per second.

Leech Lake reservoir when full being about 4 feet below the level of Lake Winnibigoshish reservoir, a channel between the two would make it possible to draw off the surplus water from Lake Winnibigoshish reservoir, storing it in Leech Lake, to great advantage at times. Such a channel could be constructed at small expense. The efficiency of the reservoir system could also be greatly increased at small expense by dredging the channels above the dams and those connecting the various lakes that constitute the reservoirs. The aprons of the dams are now several feet below the level to which the water can be drawn down through the existing contracted channels.

*Summary of expenditures during the fiscal year ending June 30, 1907.*

Services.....	\$12,459.76
Supplies.....	341.17
Materials.....	941.55
Travelling expenses.....	676.28
Office expenses and contingencies.....	4,050.79
<b>Total.....</b>	<b>18,469.55</b>

*Total liabilities incurred in each fiscal year.*

During fiscal year ending June 30—		During fiscal year ending June 30—	
1895.....	\$6,416.19	1904.....	\$11,280.00
1896.....	30,800.15	1905.....	12,940.00
1897.....	35,180.41	1906.....	24,789.03
1898.....	19,487.80	1907.....	15,112.56
1899.....	14,100.02	Amount available June 30,	
1900.....	19,350.00	1907.....	972.41
1901.....	18,498.12	<b>Total.....</b>	<b>235,728.87</b>
1902.....	14,500.00		
1903.....	12,302.18		

**ALLOTMENTS.**

January 25, 1895.....	\$17,590.00	August 12, 1901.....	\$12,948.12
June 15, 1895.....	18,852.91	July 16, 1902.....	13,300.00
June 20, 1896.....	5,000.00	July 23, 1903.....	12,182.18
July 24, 1896.....	23,471.98	July 12, 1904.....	5,540.00
For repairs to Pine River reservoir.....	7,481.86	July 13, 1905.....	13,400.00
August 4, 1897.....	23,870.00	October 19, 1905.....	7,000.00
August 4, 1898.....	16,347.80	May 29, 1906.....	2,500.00
August 15, 1899.....	12,720.02	June 28, 1906.....	15,914.00
July 16, 1900.....	20,610.00	<b>Total.....</b>	<b>235,728.87</b>
September 28, 1900.....	7,000.00		

**COMMERCIAL STATISTICS.**

For commercial statistics, reference must be made to the reports upon the improvement of the Mississippi River between Brainerd and Grand Rapids, Minn., and between Minneapolis and St. Paul, Minn.



## A A 4.

## IMPROVEMENT OF ST. CROIX RIVER, WISCONSIN AND MINNESOTA.

The approved project and report of progress of the work up to June 30, 1906, will be found in the Report of the Chief of Engineers for 1907, Part 1, page 503.

In August, 1906, the dredge *St. Croix* and fleet of barges were taken from the mouth of the Minnesota River to Sweazy's Landing, near Osceola, Wis., and the dredging of the bar at that point was commenced September 9. A cut of 143 feet in length was made for a width of 60 feet and depth of 4 feet at low water. Total excavation, 932 cubic yards. The training dam at that point was repaired for a length of 300 feet, being raised  $2\frac{1}{2}$  feet. Work was suspended on November 6 on account of ice in the river, and the fleet was towed to Stillwater, Minn., and laid up for the winter. In May and June, 1907, the dredge and its machinery and the barges were thoroughly overhauled and repaired, the cost being \$1,371.38. At the latter part of June, 1907, the fleet proceeded to Osceola, Wis., and dredging was resumed in that vicinity.

The following is a statement of expenditures during the year:

Dredging	\$495.27
Repairing brush and stone dams	493.57
Repairing dredge and barges	1,011.86
Subsistence	247.50
Outfit of dredge	54.18
Gaugings	61.33
Inspection	59.50
Care of boats and property	440.42
St. Paul office	185.36
Total	3,048.99

*Money statement.*

July 1, 1906, balance unexpended	\$2,880.65
Amount appropriated by river and harbor act approved March 2, 1907	4,000.00
	6,880.65
June 30, 1907, amount expended during fiscal year, for maintenance of improvement	3,048.99
July 1, 1907, balance unexpended	3,831.66
July 1, 1907, outstanding liabilities	656.90
July 1, 1907, balance available	3,174.76
<div style="display: flex; align-items: center;"> <div style="font-size: 3em; margin-right: 10px;">{</div> <div>           Amount that can be profitably expended in fiscal year ending June 30, 1909, for maintenance of improvement, in addition to the balance unexpended July 1, 1907.         </div> <div style="margin-left: 20px;">3,600.00</div> </div>	
<div style="display: flex; align-items: center;"> <div style="font-size: 3em; margin-right: 10px;">{</div> <div>           Submitted in compliance with requirements of sundry civil act of June 4, 1907, and of section 7 of the river and harbor act of 1899.         </div> </div>	

## APPROPRIATIONS.

June 18, 1878.....	\$10, 000	August 18, 1894.....	\$4, 000
March 3, 1879.....	8, 000	June 3, 1896.....	15, 000
June 14, 1880.....	10, 000	March 3, 1899.....	9, 000
March 3, 1881.....	8, 000	June 13, 1902.....	2, 000
August 2, 1882.....	30, 000	April 28, 1904 (allotment).....	865
July 5, 1884.....	9, 000	March 3, 1905.....	4, 000
August 5, 1886.....	7, 500	March 2, 1907.....	4, 000
August 11, 1888.....	10, 000		
September 19, 1890.....	8, 000	Total.....	147, 365
July 13, 1892.....	8, 000		

## COMMERCIAL STATISTICS, SEASON OF 1906.

Rafted logs towed out of St. Croix River.....	feet B. M....	40, 000, 000
Rafted lumber, etc., towed out of St. Croix River:		
Lumber.....	do.....	86, 500, 000
Shingles.....	number.....	10, 000, 000
Laths.....	do.....	34, 000, 000
Loose logs run on river above Stillwater.....	{feet B. M....	93, 500, 000
	tons.....	327. 250
Number of steamboats engaged in rafting business out of Stillwater.....		16

A few steamboats made occasional trips between Taylors Falls and Stillwater during the season, and one is now running regularly between Taylors Falls and Osceola, carrying freight and passengers, but no reliable statistics can be obtained.

## A A 5.

## IMPROVEMENT OF MINNESOTA RIVER, MINNESOTA.

The approved project and the report of progress of the work up to June 30, 1906, will be found in the Report of the Chief of Engineers for 1907, Part 1, page 504.

Other than the removal of a few overhanging trees and snags from the Fort Snelling chute, no work was done, there not being sufficient funds available. Owing to the good stage of water in the river, however, there was no serious difficulty in navigating the river at the mouth.

*Money statement.*

July 1, 1906, balance unexpended.....	\$163. 64
Amount appropriated by river and harbor act approved March 2, 1907.....	2, 000. 00
	<u>2, 163. 64</u>
June 30, 1907, amount expended during fiscal year, for maintenance of improvement.....	17. 87
July 1, 1907, balance unexpended.....	<u>2, 145. 77</u>
{ Amount that can be profitably expended in fiscal year ending June 30, 1909, for maintenance of improvement, in addition to the balance unexpended July 1, 1907.....	2, 000. 00
{ Submitted in compliance with requirements of sundry civil act of June 4, 1897, and of section 7 of the river and harbor act of 1899.	

## APPROPRIATIONS.

March 3, 1867-----	\$37,500	June 18, 1878-----	\$10,000
July 11, 1870-----	10,000	August 11, 1888-----	10,000
March 3, 1871-----	10,000	June 3, 1896-----	4,000
June 10, 1872-----	10,000	March 3, 1899-----	1,000
March 3, 1873-----	10,000	March 3, 1905-----	3,000
June 23, 1874-----	10,000	March 2, 1907-----	2,000
March 3, 1875-----	10,000		
August 14, 1876-----	10,000	Total -----	137,500

## COMMERCIAL STATISTICS.

Owing to the precarious condition of the channel at the mouth of the river, navigation on the Minnesota River has been practically confined of recent years to irregular operations of excursion steamers from St. Paul, Hastings, Stillwater, etc., to Shakopee. The Minnesota River has also become a popular resort for a large number of steam and naphtha launches operated from St. Paul and other river points.

Statistics of number of trips made and passengers carried by the various boats engaged in this navigation during the season of 1906 have not been obtainable.

## A A 6.

## IMPROVEMENT OF RED RIVER OF THE NORTH, MINNESOTA AND NORTH DAKOTA.

The approved project and the report of progress of the work up to June 30, 1906, will be found in the Report of the Chief of Engineers for 1907, Part 1, page 505.

There has been no work of improvement on Red Lake River since the season of 1900, when the river north of Thief River Falls was well cleared of obstructions in the shape of snags, bowlders, and overhanging trees.

On September 11, 1906, work was commenced on the bars south of Grand Forks, N. Dak. Seven miles of river were worked over and cuts aggregating 3,045 linear feet were dredged to a width of 60 feet and depth of 4 feet at low water. Material removed, 14,050 cubic yards. With the dredged material 3,045 linear feet of training dams were constructed. The steamer *Ogama*, operated as a snag boat, removed from the river banks and channel 165 overhanging trees, 73 snags and stumps, 2 deadhead logs, and 3 bowlders containing 1½ cubic yards. On account of the formation of ice in the river, operations were suspended at the end of October and the fleet laid up at Grand Forks for the winter.

Early in May the fleet was overhauled and repaired and work was resumed on the bars south of Grand Forks. At the close of the fiscal year 10½ miles of river had been worked over, 810 linear feet being dredged, 60 feet wide and 4 feet deep at low water. Material removed, 4,850 cubic yards. With this material 810 linear feet of training dams were constructed. The steamer *Ogama* removed 45 overhanging trees and 12 snags.

The following is a statement of the expenditures made during the year:

Repairs to boats and machinery-----	\$577. 10
Dredging and snagging-----	1, 883. 99
Subsistence -----	412. 95
Fuel -----	208. 55
Outfit -----	165. 13
Care of boats and property-----	810. 53
Inspection and St. Paul office expenses-----	952. 80
<b>Total</b> -----	<b>5, 011. 05</b>

### Money statement.

July 1, 1906, balance unexpended-----	\$3, 442. 11
Amount appropriated by river and harbor act approved March 2, 1907-----	15, 000. 00
Amount derived from sales-----	149. 50
	<hr/> 18, 591. 61
June 30, 1907, amount expended during fiscal year, for maintenance of improvement-----	5, 011. 05
July 1, 1907, balance unexpended-----	13, 580. 56
July 1, 1907, outstanding liabilities-----	1, 067. 41
	<hr/> 12, 513. 15
{ Amount that can be profitably expended in fiscal year ending June 30, 1909, for maintenance of improvement, in addition to the balance unexpended July 1, 1907-----	7, 500. 00
{ Submitted in compliance with requirements of sundry civil act of June 4, 1897, and of section 7 of the river and harbor act of 1899.	

### APPROPRIATIONS.

August 14, 1876-----	\$10, 000	July 13, 1892-----	\$25, 000
June 18, 1878-----	30, 000	August 18, 1894-----	15, 000
March 3, 1879-----	25, 000	June 3, 1896-----	20, 000
June 14, 1880-----	20, 000	March 3, 1899-----	25, 000
March 3, 1881-----	18, 000	June 13, 1902-----	10, 000
August 2, 1882-----	10, 000	April 28, 1904 (allotment)---	1, 623
July 5, 1884-----	10, 000	March 3, 1905-----	9, 000
August 5, 1886-----	50, 000	March 2, 1907-----	15, 000
August 11, 1888-----	20, 000		
September 19, 1890-----	25, 000	<b>Total</b> -----	<b>338, 623</b>

### Receipts from sales.

June 15, 1907-----	\$122. 00
June 29, 1907-----	27. 50
<b>Total</b> -----	<b>149. 50</b>

### COMMERCIAL STATISTICS.

*Red River of the North.*—Two steamboats from 25 to 100 tons burden and about 30 inches draft, with a fleet of 12 barges, were operated on the river from Grand Forks, N. Dak. Total freight carried, 13,985 tons.

*Red Lake River.*—Four boats carried general merchandise and passengers to points on Red Lake, the total tonnage in 1906 being estimated at about 300. About 625 passengers were carried. Fifty-five million feet B. M. of logs were run on the river during the year.

Five steamboats are running on Red Lake, towing the above 55,000,000 feet of logs to the head of Red Lake River.

## A A 7.

IMPROVEMENT OF WARROAD HARBOR AND WARROAD RIVER,  
MINNESOTA.

The approved project and report of progress of the work up to June 30, 1906, will be found in the Annual Report of the Chief of Engineers for 1907, Part 1, page 508.

Work on the outer bar was continued until the end of October, 1906, and a 100-foot channel completed to a depth of 9 feet between stations 1 and 18, and to a depth of 11 feet between stations 18 and 62, at the standard lake level, 7.2 feet on the Warroad gauge. When the weather was too rough for work on the outer bar the dredge was operated on the inner channel between stations O and 29 A, a channel being cut 100 feet wide and 9 feet deep, standard gauge. Work was suspended October 28, 1906, and the fleet laid up for the winter. In March and April, 1907, the dredge and machinery were overhauled and repaired and dredging resumed May 8.

A total of 75,039 cubic yards of material was removed during the year at a cost of 9.94 cents per cubic yard. During the months of July, August, and September, 1906, and June, 1907, a double crew was employed, the dredge working day and night. The balance of the time a single crew was engaged, working in daytime only.

A map,<sup>a</sup> showing the condition of the improvement at the close of the fiscal year, is appended.

On account of the heavy wind storms which are prevalent on Lake of the Woods the dredged channel shoals up when operations are suspended. This necessitates redredging the excavated channel each season. The cost of this work of maintenance is approximately one-third of the amount expended each year.

The above-described work was accomplished during the year under the immediate supervision of Mr. R. Davenport, assistant engineer, who also performed the like duties in connection with improving Red River of the North, Minnesota, and Dakota; improving St. Croix and Minnesota rivers, Wisconsin and Minnesota; the preliminary examinations ordered by the river and harbor act approved March 3, 1905, and the acquisition of lands and flowage easements required on account of the reservoirs at the headwaters of the Mississippi river.

The following is a statement of the expenditures during the year:

Dredging .....	\$5, 023. 33
Subsistence .....	1, 030. 34
Fuel .....	292. 66
Outfit of dredge .....	319. 46
Repairs .....	1, 562. 37
Surveys and soundings .....	101. 55
Care of boats and property .....	282. 20
Inspection and St. Paul office expenses .....	2, 339. 28
Total .....	10, 951. 19

The improvement of the harbor at Warroad depends very largely upon the level of the Lake of the Woods, all estimates for dredging of the harbor and its approaches being based upon the maintenance

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of this level at or above the datum of 7.2 feet on the Warroad Harbor gauge. The level of the lake may be readily regulated by inserting or removing stop planks in the Keewatin dam near Rat Portage, Ontario, which is now under the control of the government of the Dominion of Canada.

## Money statement.

July 1, 1906, balance unexpended.....	\$23,233.60
June 30, 1907, amount expended during fiscal year, for maintenance of improvement.....	10,951.19
July 1, 1907, balance unexpended.....	12,282.41
July 1, 1907, outstanding liabilities.....	2,360.21
July 1, 1907, balance available.....	9,922.20
July 1, 1907, amount covered by uncompleted contracts.....	1,719.00
Amount (estimated) required for completion of existing project.....	13,500.00
Amount that can be profitably expended in fiscal year ending June 30, 1909, in addition to the balance unexpended July 1, 1907:	
For works of improvement.....	\$10,000.00
For maintenance of improvement.....	5,000.00
	15,000.00
Submitted in compliance with requirements of sundry civil act of June 4, 1897, and of section 7 of the river and harbor act of 1899.	

## APPROPRIATIONS.

March 3, 1899.....	\$3,000
June 13, 1902.....	45,000
March 3, 1905.....	35,000
Total.....	83,000

## COMMERCIAL STATISTICS.

The town of Warroad, now 7 years old, has a population of about 1,000, and the adjacent country is rapidly filling up with settlers.

Until recently Warroad Harbor has had no regular lake traffic, the condition of the entrance to the harbor not having been such as to permit it.

On Lake of the Woods there are at present 25 or more registered Canadian boats, ranging from 30 to 486 tons burden, any of which can now visit Warroad Harbor.

The United States boats connected with Warroad Harbor are the propellers *Na-ma-puk* and *Knute Nelson*, the former about 36 feet long and the latter about 80 feet, four sailing vessels, and two gasoline boats. A total of about 3,200 tons of freight and 3,260 passengers were carried during the season of 1906.

## Foreign commerce of the port of Warroad.

Year.	Imports.	Exports.	Year.	Imports.	Exports.
	Tons.	Tons.		Tons.	Tons.
1900.....	254	1,215	1904.....	2,754	9,929
1901.....	315	3,010	1905.....	3,300	20,867
1902.....	1,486	3,395	1906.....	4,000	28,684
1903.....	2,624	9,170			

## A A 8.

## SURVEY OF OTTERTAIL LAKE AND OTTERTAIL RIVER, RED LAKE AND RED LAKE RIVER, MINNESOTA, AND BIG STONE LAKE AND LAKE TRAVERSE, MINNESOTA AND SOUTH DAKOTA.

The approved project and report of progress of the work up to June 30, 1906, will be found in the Annual Report of the Chief of Engineers for 1907, Part 1, page 509.

On account of the heavy snowfall of last winter it seemed likely that there would be high water on all the streams covered by this project, and preparations were made for taking high-water gaugings at Grand Forks and Wahpeton, N. Dak. (Red River of the North and Red Lake River), Thief River Falls, Minn. (Red Lake River), Battle Lake, Minn. (Ottertail River), and Ortonville, Minn. (Minnesota River). The warm weather at the latter end of March began to melt the snow rapidly, but before flood stages were reached the weather changed, and the continued cold weather prevented the snow from passing off too rapidly and allowed the excess waters to run off gradually.

Meter measurements were made in the Red River of the North and Red Lake River at Grand Forks and Wahpeton, N. Dak., and gauges were reestablished and read at Thief River Falls, Battle Lake, and Ortonville, Minn., until the danger of flood stages was passed.

*Money statement.*

July 1, 1906, balance unexpended.....	\$9, 179. 02
June 30, 1907, amount expended during fiscal year.....	968. 12
July 1, 1907, balance unexpended.....	8, 210. 90
July 1, 1907, outstanding liabilities.....	11. 00
July 1, 1907, balance available.....	8, 199. 90

## APPROPRIATIONS AND ALLOTMENTS.

By act—

Passed June 3, 1896 (allotment for Big Stone Lake, etc.....)	\$2, 500
Approved March 3, 1899:	
Appropriation for Big Stone Lake, etc.....	5, 000
Appropriation for Red Lake and Red Lake River.....	5, 000
Appropriation for Ottertail Lake, etc.....	3, 000
Approved June 13, 1902 (allotment for continuing surveys).....	10, 000
Total .....	25, 500

## A A 9.

## GAUGING MISSISSIPPI RIVER AT OR NEAR ST. PAUL, MINNESOTA.

The approved project and report of progress of the work will be found in the Report of the Chief of Engineers for 1907, page 510.

During the year the gauges between Lock No. 2 and the mouth of the Minnesota River were read and meter measurements of the Mississippi River taken between Lock No. 2 and Lock No. 1.

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## Money statement.

July 2, 1906, allotment for fiscal year 1907-----	\$500. 00
July 1, 1907, balance unexpended-----	500. 00
July 1, 1907, outstanding liabilities-----	250. 92
July 1, 1907, balance returned to Treasury-----	249. 08

## ALLOTMENTS.

For fiscal year ending June 30—		For fiscal year ending June 30—	
1889 -----	\$900. 00	1903 -----	\$500. 00
1890 -----	600. 00	1904 -----	500. 00
1891 -----	900. 00	1905 -----	500. 00
1892 -----	900. 00	1906 -----	500. 00
1893 -----	500. 00	1907 -----	500. 00
1894 -----	500. 00		
1895 -----	500. 00	Total allotted-----	9, 300. 00
1896 -----	500. 00	Returned to Treasury -----	2, 538. 20
1897 -----	500. 00		
1898 -----	500. 00	Total expended -----	6, 761. 80
1900 -----	500. 00		



## APPENDIX B B.

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### IMPROVEMENT OF MISSOURI RIVER, AND OF OSAGE AND GASCONADE RIVERS, MISSOURI.

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REPORT OF CAPT. EDWARD H. SCHULZ, CORPS OF ENGINEERS, OFFICER IN CHARGE, FOR THE FISCAL YEAR ENDING JUNE 30, 1907.

#### IMPROVEMENTS.

- |                           |                               |
|---------------------------|-------------------------------|
| 1. Missouri River.        | 3. Gasconade River, Missouri. |
| 2. Osage River, Missouri. |                               |
- 

UNITED STATES ENGINEER OFFICE,  
*Sioux City, Iowa, July 2, 1907.*

GENERAL: I have the honor to submit herewith my annual reports upon the improvement of the Missouri, Osage, and Gasconade rivers for the fiscal year ending June 30, 1907.

Very respectfully,

EDWARD H. SCHULZ,  
*Captain, Corps of Engineers.*

Brig. Gen. A. MACKENZIE,  
*Chief of Engineers, U. S. A.*

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#### B B 1.

### IMPROVEMENT OF MISSOURI RIVER.

The improvement work on the Missouri River during the past fiscal year has consisted in the maintenance of existing works and in snagging.

The river and harbor act of March 2, 1907, contained the following items for work on the Missouri River:

Improving Missouri River from mouth to Fort Benton: For maintenance, four hundred thousand dollars, of which amount one hundred and fifty thousand dollars may be expended between the mouth and Kansas City, one hundred and fifty thousand dollars between Kansas City and Sioux City, and one hundred thousand dollars between Sioux City and Fort Benton, one half of which last amount shall be expended north of the forty-sixth parallel: *Provided*, That these amounts shall be applied in the first instance for the purpose of clearing the river of snags with a view to navigation, and no part of such amount shall be applied for revetment or the protection of banks of the stream unless such revet-

ment or protection is directly and necessarily required for purposes of navigation: *Provided further*, That so much of the amount as is to be expended north of the forty-sixth parallel may be applied for improving the harbor at Bismarck, North Dakota, on the east side of the river below the Northern Pacific Railroad bridge: *Provided further, also*, That the Secretary of War shall, as soon as practicable, cause a survey to be made to determine the necessity of continuing the improvement of the Missouri River at Saint Joseph, Missouri, to prevent a diversion of the waters of said river through Lake Contrary and other contiguous lakes, and to determine the effect of such diversion, with an estimate of the cost of the improvement, and shall also report whether the same is directly and necessarily required in the interest of navigation.

Projects have been approved for the expenditure of these sums, as follows:

*From mouth to Kansas City, Mo.*

For repairing and outfitting the snag boat <i>C. R. Suter</i> -----	\$10,000
For operating the snag boat <i>C. R. Suter</i> , two seasons-----	85,000
For care of plant, office, and traveling expenses, etc., two seasons-----	30,000
For extraordinary contingencies and such work of revetment or bank protection as is directly and necessarily required for purposes of navigation-----	25,000
	<hr/> 150,000 <hr/>

*From Kansas City, Mo., to Sioux City, Iowa.*

For repairing and outfitting the snag boat <i>James B. McPherson</i> -----	\$10,000
For operating snag boat <i>James B. McPherson</i> , two seasons-----	59,000
For care of plant, office and traveling expenses, etc., two seasons-----	30,000
For survey work at St. Joseph, Mo.-----	1,000
For extraordinary contingencies and such work of revetment or bank protection as is directly and necessarily required for the purposes of navigation-----	50,000
	<hr/> 150,000 <hr/>

*From Sioux City, Iowa, to Fort Benton, Mont.*

For launching, repairing, and outfitting the snag boat <i>Mandan</i> -----	\$3,000
For operating the snag boat <i>Mandan</i> between Sioux City, Iowa, and the forty-sixth parallel, two seasons-----	30,000
For operating the snag boat <i>Mandan</i> between the forty-sixth parallel and Fort Benton, Mont.-----	7,000
For improving the harbor at Bismarck, N. Dak., etc., on the east side of the river below the Northern Pacific Railroad bridge, by construction of pile dikes or such other works as may be suitable-----	40,000
For care of plant, office and traveling expenses, etc., between Sioux City, Iowa, and the forty-sixth parallel-----	17,000
For care of plant, etc., above forty-sixth parallel-----	3,000
	<hr/> 100,000 <hr/>

Upon the approval of the project, work was immediately begun repairing and outfitting the three snag boats. The *Mandan* commenced her regular work of snagging at Bismarck, N. Dak., on May 17, 1907, and the *McPherson* at Kansas City, Mo., on June 24, 1907. The *Suter* started out on May 12, 1907, but it was soon ascertained that her boilers were in bad condition and they were later condemned by the local boiler inspector. She was towed to St. Louis, Mo., from Gasconade, Mo., by the *McPherson*, arriving there May 18, 1907, and is still at that port having an entire new battery of boilers made. It is expected that she will be ready for work upon the subsidence of the June flood.

The balance of available funds from last year's project was so small that no work of any consequence was done previous to March 21, 1907, when the present project was approved.

Five short spur dikes were built in Wilhoit Bend by local interests, with Government plant loaned, under authority of War Department.

In accordance with act of Congress of March 4, 1907, appropriating \$5,000 for the destruction of an ice gorge in the vicinity of Vermilion, S. Dak., the project for which was later submitted and approved, a small party was organized and ammunition purchased for that purpose on March 8, 1907. After several days of hardship in transporting two yawls with ammunition and tools over 7 miles of frozen flooded district, the party arrived at the Missouri River below the site of the gorge a few hours after it let go from natural causes, when the party was disbanded and the yawls and supplies shipped back to the ice harbor at Sioux City, Iowa.

All plant in storage at the several harbors, from Bismarck, N. Dak., to Gasconade, Mo., was properly taken care of by the usual force of watchmen.

Examinations were made from time to time at different localities along the river and special reports submitted.

In accordance with river and harbor bill, act of Congress March 2, 1907, estimates were prepared and submitted, of the cost of making necessary surveys to show the needs of improvement.

The Missouri River appears at present to be the object of renewed interest and there are indications of a greater or less revival of its commercial activity. Two boats have recently been placed in commission between Kansas City and St. Louis, Mo., and two others are projected.

The entire work was in local charge of Mr. W. R. DeWitt, U. S. assistant engineer.

### *Money statements.*

#### UPPER RIVER.

July 1, 1906, balance unexpended.....	\$15, 208. 26
Amount appropriated by river and harbor act approved March 2, 1907.....	100, 000. 00
Amount appropriated by deficiency act March 4, 1907.....	5, 000. 00
Amount received from sale of property.....	554. 99
	<hr/>
	120, 763. 25
June 30, 1907, amount expended during fiscal year:	
For works of improvement.....	\$370. 85
For maintenance of improvement.....	12, 993. 00
	<hr/>
	13, 363. 85
July 1, 1907, balance unexpended.....	107, 399. 40
July 1, 1907, outstanding liabilities.....	6, 964. 49
	<hr/>
July 1, 1907, balance available.....	100, 434. 91
	<hr/>
Amount (estimated) required for completion of existing project.....	Indefinite.
	<hr/>
Amount that can be profitably expended in fiscal year ending June 30, 1909, in addition to the balance unexpended July 1, 1907:	
For works of improvement.....	\$250, 000. 00
For maintenance of improvement.....	100, 000. 00
	<hr/>
	350, 000. 00
Submitted in compliance with requirements of sundry civil act of June 4, 1897, and of section 7 of the river and harbor act of 1899.	

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## LOWER RIVER.

July 1, 1906, balance unexpended.....	\$55,320. 15
Amount appropriated by river and harbor act approved March 2, 1907.....	300,000. 00
Amount received from sale of property.....	2,328. 57
Amount received by transfer.....	8. 33
	<u>357,657. 05</u>
June 30, 1907, amount expended during fiscal year, for maintenance of improvement.....	40,429. 90
July 1, 1907, balance unexpended.....	317,227. 15
July 1, 1907, outstanding liabilities.....	29,101. 44
	<u>288,125. 71</u>
July 1, 1907, balance available.....	
Amount (estimated) required for completion of existing project.....	<u>Indefinite.</u>
{ Amount that can be profitably expended in fiscal year ending June 30, 1909, in addition to the balance unexpended July 1, 1907:	
For works of improvement.....	\$1,000,000. 00
For maintenance of improvement.....	250,000. 00
	<u>1,250,000. 00</u>
Submitted in compliance with requirements of sundry civil act of June 4, 1897, and of section 7 of the river and harbor act of 1899.	

## APPROPRIATIONS AND ALLOTMENTS.

### IMPROVING UPPER MISSOURI RIVER, EXCLUSIVE OF THOSE FOR SNAGGING.

August 14, 1876.....	\$20,000. 00
June 18, 1878.....	42,500. 00
March 3, 1879.....	60,000. 00
June 14, 1880.....	43,000. 00
March 3, 1881.....	92,000. 00
August 2, 1882.....	100,000. 00
July 5, 1884.....	140,000. 00
August 5, 1886.....	60,000. 00
August 11, 1888.....	200,000. 00
September 19, 1890.....	107,088. 00
July 13, 1892.....	152,338. 47
August 18, 1894.....	110,000. 00
March 2, 1895.....	40,000. 00
June 3, 1896.....	235,000. 00
March 3, 1899.....	205,000. 00
June 13, 1902.....	100,000. 00
June 13, 1902 (allotment).....	2,000. 00
March 3, 1905.....	75,000. 00
March 3, 1907.....	100,000. 00
March 4, 1907, deficiency act (destruction of ice gorge in Missouri River, South Dakota).....	5,000. 00
	<u>1,888,926. 47</u>
Total appropriations and allotments.....	
Received from sale of condemned property.....	1,697. 15
Received from refundment.....	11. 55
	<u>1,890,635. 17</u>

## IMPROVING UPPER MISSOURI RIVER BY SNAGGING.

September 19, 1890-----	\$192,912.00
July 13, 1892-----	161.53
March 3, 1893-----	50,000.00
August 18, 1894-----	50,000.00
June 3, 1896-----	50,000.00
March 3, 1899-----	50,000.00
Total-----	<u>393,073.53</u>

## IMPROVING MISSOURI RIVER FROM MOUTH TO SIOUX CITY, IOWA.

June 18, 1878-----	\$285,000.00
March 3, 1879-----	174,000.00
June 14, 1880-----	232,000.00
March 3, 1881-----	233,000.00
August 2, 1882-----	850,000.00
July 5, 1884-----	500,000.00
August 5, 1886-----	375,000.00
August 11, 1888-----	800,000.00
February 22, 1890-----	75,000.00
September 19, 1890-----	800,000.00
July 13, 1892-----	600,000.00
March 3, 1893-----	700,000.00
August 18, 1894-----	700,000.00
March 2, 1895-----	710,000.00
June 3, 1896-----	300,000.00
June 4, 1897-----	300,000.00
July 1, 1898-----	300,000.00
January 5, 1899-----	100,000.00
March 3, 1899-----	300,000.00
June 6, 1900-----	250,000.00
June 13, 1902-----	175,000.00
February 18, 1904-----	19.35
April 28, 1904 (allotment)-----	50,000.00
March 3, 1905-----	150,000.00
March 2, 1907-----	300,000.00
Total-----	<u>9,239,019.35</u>

The total of appropriations and receipts from other sources for the Missouri River from mouth to Sioux City, Iowa, is:

Act of August 2, 1882, applied to works above Sioux City, Iowa-----	\$4,000.00	
Survey of Missouri River from mouth to Fort Benton, act of August 2, 1882-----	8,844.39	
Act of August 5, 1886, applied to removing obstructions from Missouri River-----	1,982.80	14,827.19
Funds contributed by citizens of St. Joseph, Mo-----		50,000.00
Refunded on account of overpayments, etc-----		3,488.76
Received from transfer of materials-----		5,021.59
Received from transfer of surplus property-----		7,556.15
Received from sale of condemned and surplus property-----		12,050.09
Total-----		<u>9,331,963.13</u>

## COMMERCIAL STATISTICS.

## UPPER MISSOURI RIVER.

During the calendar year 1906 the number of boats engaged in carrying freight and passengers, exclusive of those doing a strictly ferriage business, was 10. The freight and passengers carried by them are as follows:

	Tons.
Grain .....	9,540
Live stock .....	8,250
Lumber and wood .....	5,567
Building material and sand .....	11,780
General merchandise .....	8,850
<b>Total .....</b>	<b>43,987</b>

Passengers, 185; commerce of upper river expressed in mile-tons, 2,722,307.

*Commerce of the Missouri River from mouth to Stouss City, Iowa, during the calendar year 1906.*

The following table, giving the amount of freight carried, towed, and rafted, but not including any ferriage, is an approximation to the lower Missouri River trade for 1906:

TABLE 1.

Class.	Grain.	Live stock.	Lumber and wood.	Building material and sand.	General merchandise.	Total.	Mile-tons.
	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	
Short-trade packets, miscellaneous boats, etc.....	12,836	1,086	1,867	15,510	3,093	34,332	1,215,415
Sand steamers and barges.....				471,173		471,173	43,236
Rafts .....			14,368			14,368	260,186
Riprap, willows, and lumber used by private parties for bank protection in vicinity of St. Joseph and Kansas City, Mo.....				53,475		53,475	805,542
<b>Total .....</b>	<b>12,836</b>	<b>1,086</b>	<b>16,225</b>	<b>540,158</b>	<b>3,093</b>	<b>573,348</b>	<b>2,324,379</b>

Three hundred and thirty-six passengers were carried.

The following table gives the total, in tons, for the different classes of trade during the last eight years for the lower Missouri:

TABLE 2.

Class.	1906.	1905.	1904.	1903.	1902.	1901.	1900.	1899.
Long-trade packets .....			4,677	2,376	7,989	7,806	4,397	715
Short-trade packets, etc.....	34,332	23,468	19,480	51,505	38,051	87,588	34,787	87,610
Sand and wood steamers and barges .....	471,173	305,373	402,149	678,878	334,164	463,840	232,395	213,514
Rafts .....	14,368	550	4,459	1,965	12,073	10,935	5,727	6,275
Mattress brush, stone, and dike material for bank-protection work .....	53,475	14,044	24,285	15,547	18,250			
<b>Total .....</b>	<b>573,348</b>	<b>343,435</b>	<b>455,000</b>	<b>750,291</b>	<b>410,527</b>	<b>569,689</b>	<b>277,306</b>	<b>263,114</b>

TABLE 3.—Comparative commerce of the lower Missouri River, expressed in mile-tons.

Class.	1906.	1905.	1904.	1903.	1902.	1901.	1900.	1899.
Long-trade packets.....			971,315	494,746	1,435,605	999,116	558,807	98,198
Short-trade packets, etc.....	1,215,415	307,968	392,568	1,250,966	626,925	1,089,767	360,378	410,580
Sand and wood steam- ers and barges.....	43,236	284,649	441,043	149,994	429,492	668,783	460,440	422,606
Rafts.....	260,186	50,200	117,810	95,911	570,137	196,872	108,975	126,482
Mattress brush, stone, and dike material for bank-protection work.....	806,542	117,827	317,920	237,714	164,750			
Total.....	2,824,379	760,144	2,240,656	2,229,881	3,226,909	2,908,588	1,488,600	1,057,761

## B B 2.

## IMPROVEMENT OF OSAGE RIVER, MISSOURI.

Work under this project was practically completed, but on February 14, 1906, a new breach was made by the sudden disappearance of pier No. 3 and about 20 feet of the dam adjacent to it.

Owing to the conditions existing at the beginning of the year, a Board of Engineers was convened July 19, 1906, who submitted a project, which was later approved, and under which work has been carried on.

On August 25, 1906, the work suffered further damage by the sinking and total destruction of pier No. 2, section of Dam No. 3, and partial destruction of section of Dam No. 2, a portion of which was undermined to a depth of 28 feet.

The Board was reconvened September 10, 1906, and made further recommendations. In accordance with this project the following work was done during the year:

The crib dam (245 linear feet) built last year, was cut down from elevation 116 to 105 for a distance of 50 feet, the next 105 feet was lowered to 106.50 and the remaining 90 feet to 108.

The temporary brush dam above the permanent dam was cut down to elevation 106.50.

The river lock wall was strengthened by a deposit of 153 cubic yards of rock along its face.

The lower slope and apron, including decking and stringers, were removed from below sections 1 and 2, the bottom leveled off and a crib 120 feet long constructed and sunk in place below section 1. Sheet piling was driven against the upper side of the crib the entire length.

After boring relief holes through floor of dam between crib and weir, stone to the depth of 3 feet was placed thereon.

The entire cofferdam was removed except some of the round piles which could not be pulled, and they were cut off at an elevation of 106.75.

Two hundred and twenty-five cubic yards of stone was placed above the dam from pier No. 1 to end of what was left stable of section No. 2, to prevent further scour.

The lock chamber was kept free from mud around the gates.

The usual force of watchmen was on duty in care of plant and property and operating lock gates.

The work was in local charge of Mr. Robert Walker, United States superintendent.

*Money statement.*

July 1, 1906, balance unexpended.....	\$28,960.24
Amount allotted from emergency appropriation act of March 3, 1905.....	10,000.00
Amount allotted from emergency appropriation act of June 13, 1902.....	10,000.00
Amount appropriated by river and harbor act approved March 2, 1907.....	78,000.00
Amount received from sale of property.....	316.00
	<hr/>
	127,276.24
June 30, 1907, amount expended during fiscal year, for maintenance of improvement.....	19,497.14
	<hr/>
July 1, 1907, balance unexpended.....	107,779.10
July 1, 1907, outstanding liabilities.....	4,324.50
	<hr/>
July 1, 1907, balance available.....	103,454.60
Amount (estimated) required for completion of existing project.....	Indefinite.
	<hr/>
{ Amount that can be profitably expended in fiscal year ending June 30, 1909, in addition to the balance unexpended July 1, 1907:	
For works of improvement, lock and dam.....	\$160,000.00
For maintenance of improvement.....	20,000.00
	<hr/>
	180,000.00
{ Submitted in compliance with requirements of sundry civil act of June 4, 1897, and of section 7 of the river and harbor act of 1899.	

APPROPRIATIONS AND ALLOTMENTS.

August 18, 1894.....	\$46,000.00
June 3, 1896.....	50,000.00
March 3, 1899.....	25,000.00
June 6, 1900.....	146,000.00
June 13, 1902.....	30,000.00
Balances transferred January 15, 1895, from Maj. Charles J. Allen, Corps of Engineers:	
September 19, 1890.....	\$42,655.18
July 13, 1892.....	43,366.44
	<hr/>
	86,021.62
March 3, 1905.....	80,000.00
Allotted from emergency appropriation, river and harbor act of March 3, 1905.....	10,000.00
Allotted from appropriation act of June 13, 1902.....	10,000.00
March 2, 1907.....	78,000.00
Refundment on account of overpayment.....	15.83
Received from sale of property.....	316.00
	<hr/>
Total.....	561,353.45



## COMMERCIAL STATISTICS.

The steamboat traffic on the Osage River was performed principally by the steamers *J. R. Wells*, *Buck Elk*, and *Romana*, carrying 1,500 passengers.

TABLE 1.—*Close approximation to the amount of river trade during 1906.*

Class.	Grain.	Live stock.	Lumber and wood.	Railroad ties.	Building material and sand.	General merchandise.	Total.	
	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Mile-tons.
Packets.....	2,494	1,487	1,557	.....	474	4,407	10,419	862,006
Rafts.....	.....	.....	3,400	6,687	.....	.....	10,087	457,074
Total.....	2,494	1,487	4,957	6,687	474	4,407	20,506	819,080

TABLE 2.—*Comparative statement of the commerce of the river, expressed in tons, from 1906 to 1898.*

Shipments.	1906.	1905.	1904.	1903.	1902.	1901.	1900.	1899.	1898.
Hay and grain.....	2,494	1,092	466	1,496	6,000	4,232	8,722	4,077	3,418
Live stock.....	1,487	141	827	489	153	1,058	934	873	1,088
Lumber, wood, and ties.....	11,644	5,983	18,375	24,256	74,886	56,221	76,583	57,663	74,881
Building material and gravel.....	474	204	14,573	10,639	12,869	8,000	7,500	9,945	3,015
General merchandise, farm machinery, etc.....	4,407	1,164	1,430	1,584	2,284	2,738	2,385	4,144	1,984
Barytes.....	.....	94	75	85	8	90	70	.....	.....
Total.....	20,506	8,678	35,746	38,501	95,194	72,339	96,144	76,702	84,286

TABLE 3.—*Comparative commerce of the river, expressed in mile-tons, from 1906 to 1898.*

Class.	1906.	1905.	1904.	1903.	1902.	1901.	1900.	1899.	1898.
Packets.....	362,006	557,195	294,104	263,018	675,705	277,106	545,107	393,136	349,955
Rafts, etc.....	457,074	158,000	980,416	970,723	3,334,065	2,425,710	3,060,215	2,968,121	3,825,099
Total..	819,080	715,195	1,274,520	1,233,741	4,009,770	2,702,816	3,605,322	3,361,257	4,175,054

## B B 3.

## IMPROVEMENT OF GASCONADE RIVER, MISSOURI.

The river and harbor act of March 2, 1907, appropriated the sum of \$10,000 for continuing improvement of the river. A project has been approved providing for the expenditure of this money along the lines heretofore followed.

In addition to the above, \$100 was allotted from the appropriation of March 2, 1907, for preliminary examinations and surveys.

During the past season operations have been carried on at the following points: Deer Slough, Cooper Hill, Mount Sterling, Sand shoals, Clay Bank shoals, Pryors Mill Bend, Buzzard Island, Sweet Water Island, Hensleys shoals, Koellings Island, Deppes shoals, Turnpike shoals, and Woodpecker Island, and consisted of repairing old dams and building new ones wherever necessary, clearing the channel of snags and wreck heaps, and removing overhanging trees.

The work was in local charge of Mr. W. R. De Witt, United States assistant engineer.

It is considered that a small dredge boat operating continuously on this stream would accomplish desired results and much more economically and efficiently than the present method of improvement, and an appropriation of \$20,000 is earnestly recommended for the construction of such a boat.

The work on this river is undoubtedly of great benefit to navigation and should be provided for.

#### *Money statement.*

July 1, 1906, balance unexpended.....	\$9,802.27
Amount appropriated by river and harbor act approved March 2, 1907..	10,000.00
Amount received from sale of property.....	124.31
	<hr/>
	19,926.58
June 30, 1907, amount expended during fiscal year:	
For works of improvement.....	\$6,007.88
For maintenance of improvement.....	4,000.00
	<hr/>
	10,007.88
July 1, 1907, balance unexpended.....	9,918.70
July 1, 1907, outstanding liabilities.....	1,341.72
	<hr/>
July 1, 1907, balance available.....	8,576.98
Amount (estimated) required for completion of existing project....	Indefinite.
	<hr/>
{ Amount that can be profitably expended in fiscal year ending June 30, 1909, in addition to the balance unexpended July 1, 1907:	
For works of improvement.....	\$20,000.00
For maintenance of improvement.....	7,500.00
	<hr/>
	27,500.00
{ Submitted in compliance with requirements of sundry civil act of June 4, 1897, and of section 7 of the river and harbor act of 1899.	

#### APPROPRIATIONS AND ALLOTMENTS.

June 14, 1880.....	\$5,000.00	June 13, 1902.....	\$10,000.00
March 3, 1881.....	10,000.00	Allotted by Secretary of	
August 2, 1882.....	10,000.00	War from act of June 13,	
July 5, 1884.....	5,000.00	1902.....	1,000.00
August 5, 1886.....	7,500.00	March 3, 1905.....	15,000.00
August 11, 1888.....	5,000.00	March 2, 1907.....	10,000.00
September 19, 1890.....	4,000.00	Received from sale of con-	
July 13, 1892.....	4,000.00	demned property.....	124.31
August 18, 1894.....	5,000.00		<hr/>
June 3, 1896.....	5,000.00	Total.....	111,624.31
March 3, 1899.....	15,000.00		

#### COMMERCIAL STATISTICS.

The steamboat traffic on the Gasconade River was carried on principally by the steamers *Buck Elk*, *Henry Wohlt*, and *Julius F. Silber*, carrying 597 passengers.

TABLE 1.—*Close approximation to the amount of river trade during the year 1906.*

Class.	Grain.	Live stock.	Lumber and wood.	Railroad ties.	Building material.	General merchandise.	Total.	
	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Mile-tons.
Packets.....	4,235	359	1,766	18,420	523	751	7,624	159,150
Rafts.....			1,560				19,980	405,629
Total.....	4,235	359	3,316	18,420	523	751	27,604	564,779

TABLE 2.—*Comparative statement of the commerce of the river, expressed in tons, from 1906 to 1898.*

Shipments.	1906.	1905.	1904.	1903.	1902.	1901.	1900.	1899.	1898.
Grain and hay.....	4,235	3,764	1,896	196	4,446	2,437	4,796	2,100	1,667
Live stock.....	539	242	227	15	167	485	255	414	708
Lumber, wood, and railroad ties.....	21,736	22,814	11,733	10,551	28,305	14,869	15,504	19,864	27,134
Building material.....	523	82	93	2	9,845	418	166	6	320
General merchandise, farm machinery, etc.....	751	2,735	842	24	1,617	1,251	859	1,875	1,152
Total.....	27,604	29,837	14,791	10,788	44,380	19,460	21,580	24,259	30,981

TABLE 3.—*Comparative commerce of the river, expressed in mile-tons, during the years 1906 to 1898.*

Class.	1906.	1905.	1904.	1903.	1902.	1901.	1900.	1899.	1898.
Packets.....	159,150	425,285	226,247	9,139	1,281,188	369,223	236,992	307,376	162,594
Rafts.....	405,629	1,172,895	664,690	691,500	2,508,270	1,347,300	1,187,280	1,079,753	1,669,669
Total...	564,779	1,598,180	890,927	700,639	3,789,458	1,716,523	1,424,272	1,387,129	1,832,263



## APPENDIX C C.

### IMPROVEMENT OF CUMBERLAND RIVER, TENNESSEE AND KENTUCKY, AND OF CANEY FORK, OBION, AND FORKED DEER RIVERS, TENNESSEE.

REPORT OF MAJ. WM. W. HARTS, CORPS OF ENGINEERS, OFFICER IN CHARGE, FOR THE FISCAL YEAR ENDING JUNE 30, 1907.

#### IMPROVEMENTS.

- |   |  |
|---|--|
| 1. Obion and Forked Deer rivers, Tennessee.                             | 4. Caney Fork River, Tennessee.  |
| 2. Cumberland River, Tennessee and Kentucky.                            | 5. Removing sunken vessels or craft obstructing or endangering navigation. |
| 3. Operating and care of locks and dams on Cumberland River, Tennessee. |  |

ENGINEER OFFICE, UNITED STATES ARMY,  
*Nashville, Tenn., July 8, 1907.*

GENERAL: I have the honor to transmit herewith the annual report  
\* \* \* upon the river improvements in my charge relating to the  
Nashville, Tenn., district for the fiscal year ending June 30, 1907.

Very respectfully,

WM. W. HARTS,  
*Major, Corps of Engineers.*

Brig. Gen. A. MACKENZIE,  
*Chief of Engineers, U. S. A.*

#### C C 1.

### IMPROVEMENT OF OBION AND FORKED DEER RIVERS, TENNESSEE.

#### (A) OBION RIVER.

No work was done on this stream during the past fiscal year owing to lack of sufficient funds.

The total expenditures for the fiscal year ending June 30, 1906, were applied to the care of floating plant, which is moored at Obion, Tenn., in charge of watchman.

It is expected to send out a snagging party as early as practicable during the coming fiscal year to clear the channel of surface obstructions.

# 1608 REPORT OF THE CHIEF OF ENGINEERS, U. S. ARMY.

## Money statement.

July 1, 1906, balance unexpended.....	\$695. 15
Amount allotted from river and harbor act approved March 2, 1907.....	1, 700. 00
	<hr/> 2, 395. 15
June 30, 1907, amount expended during fiscal year, for maintenance of improvement.....	147. 65
	<hr/> 2, 247. 50
July 1, 1907, balance unexpended.....	2, 247. 50
July 1, 1907, outstanding liabilities.....	13. 00
	<hr/> 2, 234. 50
	<hr/>
{ Amount that can be profitably expended in fiscal year ending June 30, 1909, for maintenance of improvement, in addition to the balance unexpended July 1, 1907.....	1, 700. 00
{ Submitted in compliance with requirements of sundry civil act of June 4, 1897, and of section 7 of the river and harbor act of 1899.	

## APPROPRIATIONS.

July 13, 1892.....	\$7, 500	March 3, 1905 (allotment).....	\$1, 700
August 18, 1894.....	7, 500	March 2, 1907 (allotment).....	1, 700
June 3, 1896.....	6, 000		
March 3, 1899.....	2, 500	Total.....	29, 400
June 13, 1902 (allotment).....	2, 500		

## COMMERCIAL STATISTICS.

[From January 1 to December 31, 1906.]

	Tons.
Logs.....	8, 639
Lumber.....	1, 111
Railroad ties.....	1, 500
Grain.....	107
Other farm products.....	125
Live stock, large.....	580
Live stock, small.....	2
Lime and cement.....	3
General merchandise.....	291
	<hr/>
Total.....	12, 358
	<hr/>
Estimated value.....	\$92, 919
Passengers carried.....	1, 750

List of steamboats (stern-wheel) plying upon Obion River, calendar year 1906.

Name.	Registered dimensions.			Net tonnage.
	Length.	Breadth.	Depth.	
	<i>Feet.</i>	<i>Feet.</i>	<i>Feet.</i>	
Caruthersville.....	71.0	18.0	2.5	47
Clydes.....	46.0	12.0	8.1	11
Iona.....	50.4	11.3	2	6
J. C. Atlee.....	101.0	19.4	3.8	57
Joy Patton.....	100.0	21.3	5.6	63
Sarah.....	48.0	8.5	3.2	8
Satellite.....	86.0	20.0	3.4	60

\* Gasoline.

## (B) FORKED DEER RIVER.

No work was done on this stream during the past fiscal year owing to lack of available funds.

The total expenditures for the fiscal year ending June 30, 1907, were applied to care of floating plant moored at Obion, Tenn.

It is expected to send out a snagging party as early as practicable during the coming fiscal year to clear the channel of surface obstructions.

*Money statement.*

July 1, 1906, balance unexpended.....	\$563. 35
Amount allotted from river and harbor act approved March 2, 1907.....	1, 300. 00
	<hr/> 1, 863. 35
June 30, 1907, amount expended during fiscal year, for maintenance of improvement .....	147. 14
	<hr/> 1, 716. 21
July 1, 1907, balance unexpended.....	1, 716. 21
July 1, 1907, outstanding liabilities.....	11. 50
	<hr/> 1, 704. 71
<hr/>	
{ Amount that can be profitably expended in fiscal year ending June 30, 1909, for maintenance of improvement, in addition to the balance unexpended July 1, 1907.....	1, 300. 00
{ Submitted in compliance with requirements of sundry civil act of June 4, 1897, and of section 7 of the river and harbor act of 1899.	

## APPROPRIATIONS.

## By act of—

August 2, 1882, for South Fork.....	\$3, 000
July 5, 1884, for South Fork.....	2, 000
August 5, 1886, for South Fork.....	5, 000
August 11, 1888, for South Fork.....	2, 500
August 11, 1888, for North Fork.....	4, 500
August 11, 1888, for main river.....	2, 500
September 19, 1890, for North Fork and main river.....	2, 500
July 13, 1892, for Forked Deer (completing improvement).....	3, 000

Total to complete old project.....	<hr/> 25, 000
------------------------------------	---------------

## Present project, by act of—

June 3, 1896.....	1, 000
June 3, 1896, for North Fork of Middle Fork from Dyersburg to Mississippi River .....	5, 000
March 3, 1899.....	2, 000
June 13, 1902 (allotment).....	2, 000
March 3, 1905 (allotment).....	1, 300
March 2, 1907 (allotment).....	1, 300

Total.....	<hr/> 12, 600
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## COMMERCIAL STATISTICS.

[From January 1 to December 31, 1906.]

Logs .....	Tons.
Grain .....	8, 000
Other farm products .....	107
Live stock, large .....	45
Live stock, small .....	1, 262
Lime and cement .....	108
General merchandise .....	18
	206
Total .....	9, 746
Estimated value .....	\$105, 059
Passengers carried .....	1, 800

*Comparative statement of traffic on Obion and Forked Deer rivers for six years.*

Calendar year.	Tons.	Calendar year.	Tons.
1901 .....	26, 717	1904 .....	60, 286
1902 .....	117, 415	1905 .....	56, 285
1903 .....	22, 576	1906 .....	22, 104

*List of steamboats (stern-wheel) plying upon Forked Deer River, calendar year 1906.*

Name.	Registered dimensions.			Net tonnage.
	Length.	Breadth.	Depth.	
Caruthersville .....	Feet. 71.0	Feet. 18.0	Feet. 2.5	47
Clyde <sup>a</sup> .....	46.0	12.0	3.1	11
Iona <sup>a</sup> .....	50.4	11.3	2.0	6
J. C. Atlee .....	101.0	19.4	3.8	37
Joy Patton .....	100.0	21.3	5.6	68
Sarah <sup>a</sup> .....	48.0	8.5	3.2	8
Satellite .....	86.0	20.0	3.4	60

<sup>a</sup> Gasoline.

## C C 2.

## IMPROVEMENT OF CUMBERLAND RIVER, TENNESSEE AND KENTUCKY.

## (A) BELOW NASHVILLE, TENN. (193 MILES).

During the fiscal year ending June 30, 1907, \$1,232.17 were expended, of which \$1,171.27 were applied to expenses of organizing a survey party for the location of sites for new locks and dams, and \$60.90 to maintenance of improvement.

There were no operations on this section during past fiscal year except at Lock A, for which see page 1618 of this report.

The Board of Engineers for Rivers and Harbors having reported in favor of continuing the improvement of the Cumberland River below Nashville (H. Doc. No. 699, Fifty-ninth Congress, first session),



it is very important that provision be made at once for purchasing the necessary lock sites and for commencing work on Locks B and C. It is therefore recommended that an appropriation of \$390,000 for this purpose and \$10,000 for maintenance be made for the fiscal year 1909.

*Money statement.*

July 1, 1906, balance unexpended.....	\$22, 632. 95
June 30, 1907, amount expended during fiscal year:	
For works of improvement (survey).....	\$1, 171. 27
For maintenance of improvement.....	60. 90
	<u>1, 232. 17</u>
July 1, 1907, balance unexpended.....	21, 400. 78
July 1, 1907, outstanding liabilities.....	1, 078. 46
	<u>20, 322. 32</u>
July 1, 1907, balance available.....	<u>1, 549, 818. 81</u>
Amount (estimated) required for completion of existing project....	
{ Amount that can be profitably expended in fiscal year ending June 30, 1909, in addition to the balance unexpended July 1, 1907:	
For works of improvement.....	\$390, 000. 00
For maintenance of improvement.....	10, 000. 00
	<u>400, 000. 00</u>
Submitted in compliance with requirements of sundry civil act of June 4, 1897, and of section 7 of the river and harbor act of 1899.	

APPROPRIATIONS.

IMPROVING CUMBERLAND RIVER BELOW NASHVILLE, TENN., UNDER OLD PROJECT FOR OPEN-CHANNEL WORK, FROM 1871 TO 1890.

Act of—		Act of—	
March 3, 1871.....	\$30, 000	August 5, 1882.....	\$15, 000
June 10, 1872.....	20, 000	July 5, 1884.....	7, 500
March 3, 1873.....	25, 000	August 5, 1886.....	12, 500
March 3, 1875.....	25, 000	August 11, 1888.....	10, 000
June 18, 1878.....	45, 000	September 19, 1890.....	40, 000
March 3, 1879.....	40, 000		
June 14, 1880.....	20, 000	Total.....	<u>305, 000</u>
March 3, 1881.....	15, 000		

UNDER NEW PROJECT FOR LOCKS AND DAMS, FROM 1892 TO 1907.

Act of—	
July 13, 1892.....	\$40, 000. 00
August 18, 1894.....	30, 000. 00
June 3, 1896.....	80, 000. 00
March 3, 1899.....	100, 000. 00
Amended act of June 13, 1902.....	180, 000. 00
Act of March 3, 1905.....	10, 000. 00
	<u>\$440, 000. 00</u>

RECEIPTS FROM SALES AND REDEPOSITS.

Received, account of sales.....	970. 90
Cash deposit taken up, pay due sundry persons un-	
called for.....	3. 15
	<u>974. 05</u>
Total.....	<u>440, 974. 05</u>

## COMMERCIAL STATISTICS.

[Open river.]

*Cumberland River below Nashville, Tenn., from January 1 to December 31, 1906.*

	Tons.		Tons.
Logs .....	5,987	Live stock, small .....	1,575
Lumber .....	2,744	Other farm products .....	11,650
Railroad ties .....	151,148	General merchandise .....	2,000
Hoop poles .....	1,000		
Spokes .....	155	Total .....	223,899
Tobacco .....	1,440		
Grain .....	13,920	Estimated value .....	\$3,678,420
Sand and gravel .....	31,680	Passengers carried .....	6,000
Live stock, large .....	600		

(For commerce passing Lock A, see commercial statistics "Operating and care," etc.)

*Comparative statement of traffic for six years.*

Calendar year.	Tons.	Calendar year.	Tons.
1901 .....	255,557	1904 .....	275,371
1902 .....	268,581	1905 .....	253,430
1903 .....	297,438	1906 .....	223,899

*List of steamboats (stern-wheel) plying on the Cumberland River below Nashville, Tenn., calendar year 1906.*

Name.	Registered dimensions.			Net tonnage.
	Length.	Breadth.	Depth.	
	<i>Feet.</i>	<i>Feet.</i>	<i>Feet.</i>	
Bernice .....	37.0	7.0	2.0	6
Bob Dudley .....	160.0	29.0	3.8	159
Oastalia .....	110.0	26.2	3.7	90
Charles Turner .....	104.0	20.3	3.0	73
Electra .....	170.0	35.0	5.2	273
Gate City .....	73.8	13.8	3.5	37
H. W. Buttorf .....	160.0	30.0	4.1	160
Henrietta .....	130.0	24.0	4.3	153
Henry Harley .....	160.0	29.0	3.2	162
Inverness .....	129.0	21.0	4.8	121
J. B. Richardson .....	165.0	29.0	4.0	191
Jim T. Duffy, jr. ....	120.0	26.0	3.8	146
J. S. (excursion) .....	175.0	33.0	5.5	236
Kit Carson .....	138.6	29.2	4.0	237
Little Ben <sup>a</sup> .....	45.0	11.0	1.5	5
Little Clyde .....	105.0	20.0	3.0	78
Lyda .....	122.0	24.0	2.4	80
Mackie .....	120.0	20.6	3.5	77
Margaret .....	100.0	22.0	3.0	100
Martha H. Hennen .....	112.0	23.0	4.8	77
Mary N. Michael .....	143.3	26.3	4.4	234
Monie Bauer .....	73.0	17.5	3.0	45
Pavonia .....	120.0	26.0	4.0	192
R. Dunbar .....	160.0	29.4	6.4	158
Red River .....	155.0	28.0	3.5	37
Scotia .....	100.5	13.4	3.0	31
Sycamore .....	103.6	20.3	3.0	72
W. T. Scovel .....	170.0	35.0	5.2	273

\* Gasoline.

## (B) ABOVE NASHVILLE, TENN. (357 MILES).

The amount expended under the existing project during fiscal year ending June 30, 1907, was \$78,329.40, the disbursements being distributed as follows:

Lock and Dam No. 2.....	\$42, 576. 77
Locks and Dams 3, 4, 5, 6, and 7.....	4, 883. 37
Lock and Dam No. 21.....	29, 007. 67
Maintenance.....	1, 861. 59
Total .....	78, 329. 40

The following is an account of the work done:

*Lock No. 2.*—Work has been carried on under a contract with Lawrence D. Weaning, of Cleveland, Ohio, dated June 15, 1905, for the construction, delivery, and erection of two steel lock gates, filling valves, and operating mechanism. The work of building the dam, the erection of houses for lock force, and the protecting of the bank has been carried on with a hired labor force.

The very unusually high stage of water in the river, together with scarcity and inefficiency of labor, delayed the contractor in completing the erection of the lock gates until November 6, 1906, and final payment was made December 12, 1906.

The hired labor force was employed in pumping and cleaning lock pit, framing movable dam for upper end of the lock, quarrying stone, riprapping the bank below the lock, paving the terre plein, dredging lower approach and foundation of dam, minor repairs to floating plant, finishing guard wall, building dam, erecting houses for lock force, building stone foundation under storehouse, care of buildings and plant, and building a barge for survey party on Cumberland River below Nashville.

The unusually high stage of water, together with the delay of the contractor in erecting the gates, made it impossible to finish the dam, which was begun on August 13, 1906; work was interrupted by high water from August 19 to 23, from September 6 to 18, and from September 19 to November 6. On November 18 the river began to rise and work on the dam was abandoned for the season.

The work done consisted of removing 2,178 cubic yards of deposit from lock pit at a cost of 42 cents per cubic yard, 3,582 cubic yards of stone quarried at a cost of about \$14 per cubic yard, placing 1,158 cubic yards riprap on bank at a cost of \$1.15 per cubic yard, placing 118.56 cubic yards paving on terre plein at \$2.05 per cubic yard, dredging 10,450 cubic yards of sand and gravel from lower approach and dam site at a cost of 15 cents per cubic yard, placing 952 cubic yards of stone in dam at a cost of 55 cents per cubic yard, framing and placing about 150,000 feet B. M. timber in dam at a cost of \$4.50 per 1,000 feet B. M. The houses for the lock force were almost finished.

The U. S. steamers *Cumberland*, *Henry*, and *John* were in commission from time to time and employed as needed in towing supplies and materials in connection with the work. The U. S. steamer *Cumberland* was found in need of repairs to her hull. Circular proposals for needed repairs were sent out and work awarded to the Paducah Marine Railway Company, Paducah, Ky. The *Cumberland* was

sent to Paducah on June 6, where she was placed on the ways. The repairs were finished at the close of the fiscal year at a cost of about \$4,000.

The floating plant was kept in serviceable condition by doing the necessary calking, painting, and minor repairs. A barge 16 by 60 by 2.5 feet, for use on the survey of the Cumberland River below Nashville, was built at Lock No. 2 at a cost of \$500.

*Locks 3 to 7, inclusive.*—For statement in regard to the proposals for the lock gates and operating mechanism see page 523 of the current summary.

*Lock No. 4.*—A hired labor force has been organized, and was employed principally in moving machinery, derricks, etc., from Lock A to Lock 4; erecting derricks, flooring, and inclosing space under temporary building for storing cement; building incline up bank; excavating mud at lower end of the lock; building trestle for use in unloading material; drilling 180 feet bolt holes and working United States road; unloading sand, gravel, and coal. High water has very materially interfered with the delivery of sand and gravel. Order has been given for 1,000 barrels of Portland cement to be used for construction of guard wall.

*Lock No. 21.*—The work of constructing this lock is being carried on under the continuous contract system, with two contracts in force. The contract for building concrete lock and dam with the Continental Engineering and Contracting Company, of Buffalo, N. Y., is dated September 22, 1905. The contract for construction and erection of the lock gates and maneuvering appliances with the Port Huron Shipbuilding Company, of Port Huron, Mich., is dated March 9, 1906.

Frequent rises during the year have interfered very much with the contractor for the lock and dam, which together with the scarcity of labor, makes the results accomplished during the fiscal year fall below expectations. The operations consisted in the completion of the cofferdam for the lock, repairing tram track and trestle, overhauling mixing plant, excavating earth and rock in lock pit, grading bank below lock, protecting foot of same with a mound of riprap, building concrete foundation for lock, excavating earth for abutment, quarrying stone, and delivering and storing cement. Quantities were as follows: 1,417.9 cubic yards of earth excavation; 1,979.3 cubic yards of rock excavation; 624.6 cubic yards embankment; 585.4 cubic yards of concrete; 356 cubic yards riprap, hand-placed; 28 cubic yards stone filling, and 10 linear feet of bolt holes.

The contractor for the lock gates and maneuvering appliances completed the delivery of all material February 13, 1907. The gates can not be placed until the masonry work is finished, causing delay in completing this contract.

*Snagging.*—The snag boat *Apex* with snagging party was sent to Burnside, Ky., in tow of the U. S. S. *John* during the month of May. Work was begun on May 29 and interrupted by high water from June 4 to June 18. The work done during the fiscal year was as follows, 69 miles of river having been cleared:

Snags removed.....	330	Trees deadened.....	41
Snags cut.....	95	Logs cut.....	120
Trees cut.....	344		

*Money statement.*

July 1, 1906, balance unexpended.....	\$281,684.77
Amount appropriated by river and harbor act approved March 2, 1907.....	150,000.00
Amount appropriated by sundry civil act approved March 4, 1907....	30,000.00
	<hr/> 461,684.77
June 30, 1907, amount expended during fiscal year :	
For works of improvement.....	\$76,467.81
For maintenance of improvement.....	1,861.59
	<hr/> 78,329.40
July 1, 1907, balance unexpended.....	383,355.37
July 1, 1907, outstanding liabilities.....	8,181.16
	<hr/>
July 1, 1907, balance available.....	375,174.21
July 1, 1907, amount covered by uncompleted contracts.....	209,487.05
Amount (estimated) required for completion of existing project....	450,000.00
	<hr/>
Amount that can be profitably expended in fiscal year ending June 30, 1909, in addition to the balance unexpended July 1, 1907 :	
For works of improvement.....	\$250,000.00
For maintenance of improvement.....	6,000.00
	<hr/> 256,000.00
Submitted in compliance with requirements of sundry civil act of June 4, 1897, and of section 7 of the river and harbor act of 1899.	

## APPROPRIATIONS.

IMPROVING CUMBERLAND RIVER ABOVE NASHVILLE, TENN., UNDER ORIGINAL PROJECTS FOR OPEN-CHANNEL WORK, FROM 1876 TO 1884.

Geographical division.	Act of—			
	Aug. 14, 1876.	June 18, 1878.	Mar. 8, 1879.	June 14, 1880.
1. Nashville to Kentucky line.....	\$15,000	\$20,000	\$18,000	\$15,000
2. Kentucky line to Smith shoals.....	10,000	8,000	6,000	10,000
3. Smith shoals.....	25,000	30,000	15,000	20,000
4. Smith shoals to Falls of Cumberland.....	2,000	2,000		
Total.....	52,000	60,000	39,000	45,000

Geographical division.	Act of—			Total.
	Mar. 3, 1881.	Aug. 2, 1882.	July 5, 1884.	
1. Nashville to Kentucky line.....	\$15,000			\$33,000
2. Kentucky line to Smith shoals.....	15,000			49,000
3. Smith shoals.....	10,000	\$15,000		115,000
4. Smith shoals to Falls of Cumberland.....				4,000
5. Above mouth of Jellico, Ky.....	10,000	5,000		15,000
6. Nashville to Smith shoals.....		30,000		30,000
7. Nashville to head of Smith shoals.....			\$50,000	50,000
Total.....	50,000	50,000	50,000	346,000

IMPROVING CUMBERLAND RIVER ABOVE NASHVILLE, TENN., UNDER THE PRESENT PROJECT FOR A SYSTEM OF LOCKS AND DAMS FROM NASHVILLE, TENN., TO HEAD OF SMITH SHOALS, MOUTH OF ROCKCASTLE RIVER, KENTUCKY.

## Act of—

August 5, 1886.....	\$75,000.00
August 11, 1888.....	200,000.00
September 19, 1890.....	250,000.00
July 13, 1892.....	250,000.00
August 18, 1894.....	200,000.00

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## Act of—Continued.

June 3, 1896	\$20,000.00
June 4, 1897 (sundry civil act)	350,000.00
July 1, 1898 (sundry civil act)	250,000.00
March 3, 1899	100,000.00
Amended act of June 13, 1902	200,000.00
Act of—	
March 3, 1905	124,000.00
June 30, 1906 (sundry civil act)	120,000.00
March 2, 1907	150,000.00
March 4, 1907 (sundry civil act)	30,000.00
	<b>\$2,319,000.00</b>

## RECEIPTS FROM RECOVERIES, SALES, AND REDEPOSITS.

Amount recovered from failing contractor	\$450.17
Cash deposit taken up, pay due sundry persons uncalled for	2.70
Cash deposit: Redemption of United States Internal-revenue stamps	2.18
Received on account of sales	20.85
	<b>475.90</b>
<b>Total</b>	<b>2,319,475.90</b>

## CONTRACTS IN FORCE.

### *Improving Cumberland River above Nashville, Tenn.*

#### FORMAL CONTRACTS.

- For construction, delivery, and erection of two steel lock gates, filling valves, etc., for Lock No. 2, at \$15,715.  
Contractor: Lawrence D. Weaning.  
Date of contract: June 15, 1905.  
Date of approval: July 3, 1905.  
Date of beginning work: June, 1905.  
Date of expiration: October 31, 1905. (Time limit waived August 29, 1905.) Final payment made December 12, 1906.
- For building concrete Lock and Dam No. 21:  
Total consideration (cement in barrels): \$215,658.35.  
Total consideration (cement in sacks): \$210,349.26.  
Contractor: Continental Engineering and Contracting Company, of Buffalo, N. Y.  
Date of contract: September 22, 1905.  
Date of approval: October 11, 1905.  
Date of beginning work: October, 1905.  
Date of expiration: December 1, 1907.  
At lock, abutment, etc.: Earth excavation, 48 cents per cubic yard; rock excavation, \$2 per cubic yard; embankment, 44 cents per cubic yard; concrete, \$5.22 per cubic yard (cement in sacks), \$5.45 per cubic yard (cement in barrels); riprap, hand placed, \$2.35 per cubic yard; paving, \$2.65 per cubic yard; stone filling, \$1.94 per cubic yard; puddling, \$1.50 per cubic yard; oak timber, \$65; pine timber, \$60 per thousand feet B. M.; bolt holes, 50 cents per linear foot.  
Dam: Earth excavation, \$1.10 per cubic yard; rock excavation, \$3.50 per cubic yard; concrete, \$7.22 per cubic yard (cement in sacks), \$7.45 per cubic yard (cement in barrels).
- For construction, delivery, and erection of two steel lock gates, filling valves, etc., for Lock No. 21, at \$17,900.  
Contractor: Port Huron Shipbuilding Company, of Port Huron, Mich.  
Date of contract: March 9, 1906.  
Date of approval: March 16, 1906.  
Date of beginning work: March, 1906.  
Date of expiration: Forty available working days after completion of masonry necessary for erection.

## EMERGENCY CONTRACT.

For lease of land for storing of timber during construction of Dam No. 2, Cumberland River:

Lessors: Thos. W. & H. B. Chadwell.

Date: June 26, 1905.

Rate: \$60 lump sum during occupancy.

Termination: On completion of Dam No. 2.

## COMMERCIAL STATISTICS.

[Open river.]

*Cumberland River above Nashville, Tenn., from January 1 to December 31, 1906.*

	Tons.		Tons.
Logs .....	52, 103	Iron, manufactured .....	1, 800
Lumber .....	39, 540	Sand and gravel .....	42, 930
Railroad ties .....	28, 626	Lime and cement .....	1, 501
Poles, post and piling .....	50, 209	Live stock, large .....	800
Hoop poles .....	100	Live stock, small .....	2, 030
Headings .....	375	General merchandise .....	13, 905
Staves .....	65, 175		
Wood .....	4, 000	Total .....	334, 351
Tobacco .....	1, 764		
Grain .....	7, 743	Estimated value .....	\$7, 571, 305
Other farm products .....	21, 750	Passengers carried .....	12, 365

(For commerce passing Lock 1 see commercial statistics, "Operating and care," etc.)

## Comparative statement of traffic for six years.

Calendar year.	Tons.	Calendar year.	Tons.
1901 .....	267, 211	1904 .....	242, 112
1902 .....	192, 270	1905 .....	382, 807
1903 .....	304, 462	1906 .....	334, 351

*List of steamboats (stern-wheel) plying on the Cumberland River above Nashville, Tenn., and in Kentucky, calendar year 1906.*

Name.	Registered dimensions.			Net tonnage.
	Length.	Breadth.	Depth.	
	<i>Feet.</i>	<i>Feet.</i>	<i>Feet.</i>	
Albany .....	129.0	21.0	2.5	52
Bob Dudley .....	160.0	29.0	3.8	159
C. M. Pate .....	111.6	22.4	4.0	82
Castalia .....	110.0	26.2	3.7	90
Chancy Lamb .....	136.0	28.8	4.5	194
Dick Clyde .....	95.8	17.4	3.9	76
Eclipse .....	100.0	21.2	3.9	57
Electra .....	170.0	35.0	6.2	278
EWALL .....				
H. W. Buttorff .....	160.0	30.0	4.1	160
Henrietta .....	130.0	24.0	4.8	163
Henry Harley .....	160.0	29.0	3.2	162
J. B. Richardson .....	165.0	29.0	4.0	191
"J. S." (excursion) .....	175.0	33.0	5.5	236
Jno. W. Love .....	120.0	30.0	4.0	86
Lyda .....	122.0	24.0	2.4	80
Mackie .....	120.0	20.6	3.5	77
Martha H. Hennen .....	112.0	28.0	4.8	77
Ober's Friend (gasoline) .....	64.4	15.2	1.8	10
R. Dunbar .....	160.0	29.0	4.4	158
Red River .....	155.0	28.0	3.5	97
Rowena .....	140.0	25.0	4.0	97
Sycamore .....	103.6	20.8	3.0	72
T. L. Herbert .....	117.0	24.0	3.6	80

\* Gasoline; dimensions not known.

## C C 3.

## OPERATING AND CARE OF LOCKS AND DAMS ON CUMBERLAND RIVER.

Besides operating locks, the following work was done:

*At Lock No. 1.*—No new work undertaken.

*At Lock A.*—Three outhouses, 1 cistern for lockman's house, and a kitchen for lockmaster's house were built; 620 cubic yards of stone were placed on the bank below the lock end, which had been injured by the waves causing the bank to cave, as mentioned in last annual report. (Report of Chief of Engineers, 1906, p. 1504.) Eleven pieces of sheeting next to the crest of the dam were put in to replace timbers broken up by the drift caught in the reaction. Roofs of temporary buildings were patched and the buildings whitewashed. This work was done by the lock force in addition to operating the lock.

Several breaks in the sheeting on the lower face of the dam are evident, but the river has not been low enough to determine the extent of the damage.

## ALLOTMENTS.

June 26, 1905.....	\$14,000.00
July 18, 1906.....	6,014.87

*Summary of expenditures for operating and care of locks and dams on Cumberland River for fiscal year ending June 30, 1907.*

Operating and care of locks.....	\$3,309.75
Dredging and maintenance of channel in canalized portion of river...	575.33
Maintenance of buildings and grounds.....	977.29
Maintenance of dams and floating plant.....	610.36
Office expenses and contingencies.....	1,477.85
<b>Total.....</b>	<b>6,950.58</b>

## COMMERCIAL STATISTICS.

*Statement of traffic passing locks on Cumberland River during calendar year 1906.*

	Lock No. 1.	Lock A.		Lock No. 1.	Lock A.
<b>Total lockages.....</b>	<b>750</b>	<b>457</b>	<b>Cargo—Continued.</b>		
<b>Craft:</b>			Wood..... tons..	580.0	10.0
Packets..... No..	206	201	Coal..... do.....	120.0	.....
Towboats..... do..	238	55	Fertilizers..... do..	40.0	.....
Government boats do..	25	2	Tobacco..... do..	446.5	471.6
Barges..... do..	434	165	Grain..... do..	13,820.5	14,377.2
Sand dredgers..... do..	111	.....	Other farm products,		
Small craft..... do..	223	194	tons.....	1,244.5	1,101.0
Rafts..... do..	162	12	Iron manuf'ed. tons..	15,145.5	40.0
			Sand and gravel..... do..	180.0	.....
<b>Cargo:</b>			Stone..... do..	5.5	.....
Logs..... tons..	14,522.0	396.8	Bricks..... do..	14.9	21.1
Lumber..... do..	635.2	887.7	Lime and cement..... do..	554.5	529.0
Railroad ties..... do..	1,288.4	38,706.1	Live stock, large..... do..	472.9	447.4
Poles, telegraph and			Explosives..... do..	.....	80.0
telephone..... tons..	782.4	285.8	General merchan-		
Hoop poles..... do..	160.6	215.6	dise..... tons..	6,124.7	5,656.9
Headings..... do..	.....	32.0	<b>Total.....</b>	<b>56,565.1</b>	<b>63,445.2</b>
Staves..... do..	87.5	133.4			
Spoke timber..... do..	822.7	.....	<b>Passengers.....</b>	<b>7,660</b>	<b>6,977</b>
Handles and handle					
slabs..... tons..	6.8	54.6			



*Comparative statement of traffic for two years.*

Calendar year.	Lock No. 1.		Lock A.	
	Lock-ages.	Tons.	Lock-ages.	Tons.
1905 .....	818	59,858.2	832	89,026.9
1906 .....	760	56,555.1	457	68,445.2

## C C 4.

## IMPROVEMENT OF CANEY FORK RIVER, TENNESSEE.

No active operations have been carried on during the past fiscal year. Authority was obtained to construct two flatboats at an aggregate cost of about \$500 for use in connection with work of maintenance of channel. Timber for these boats has been ordered, but has not yet been delivered. If practicable, these boats will be built and sent out this summer for the season's operations.

During fiscal year ending June 30, 1907, \$113.30 have been expended for capstan and for contingent office expenses.

*Money statement.*

Amount appropriated by river and harbor act approved March 2, 1907.	\$3,000.00
June 30, 1907, amount expended during fiscal year, for maintenance of improvement .....	113.30
July 1, 1907, balance unexpended .....	2,886.70

## APPROPRIATIONS.

June 14, 1880 .....	\$6,000	August 11, 1888 .....	\$2,500
March 3, 1881 .....	4,000	September 19, 1890 .....	2,500
August 2, 1882 .....	4,000	March 2, 1907 .....	3,000
July 5, 1884 .....	3,000		
August 5, 1886 .....	3,000	Total .....	28,000

## COMMERCIAL STATISTICS.

[From January 1 to December 31, 1906.]

	Tons.
Logs .....	120
Poles .....	120
Staves .....	575
Total .....	815
Estimated value .....	\$8,550

The only boat reported as plying on the Caney Fork River during the calendar year was the gasoline boat *Starlight*, 55 feet long, 14 feet wide, and 2 feet deep, with net tonnage of 11.

## C C 5.

## REMOVING SUNKEN VESSELS OR CRAFT OBSTRUCTING OR ENDANGERING NAVIGATION.

*Wreck of steamer Bart E. Linehan, in Cumberland River, Nashville, Tenn.*—This vessel caught fire at Ryman's elevator, on river front at Nashville, Tenn., March 30, 1905, floated downstream and sank several hundred feet below the elevator, where the wreck obstructs a portion of the river front. Complaint was received of this obstruction, and, under date of April 11, 1906, an allotment of \$800 was made for its removal. The boilers and some machinery still remain on the wreck, which belongs to the Nashville Transportation Company of Nashville, Tenn. It is expected to begin the removal as soon as there is a fair prospect for the continuance of a favorable stage of water for the work.

*Wreck of wharf boat (hull of the steamer Mayflower) in Cumberland River, Nashville, Tenn.*—This wharf boat was the dismantled hull of the old steamer *Mayflower*, and sank November 22, 1905; cause unknown. The wreck lies at the lower end of the upper Nashville wharf, and is dangerous to boats at medium and low water stages. Mr. R. L. Johnson, of Nashville, Tenn., has an emergency contract with the United States for its removal, and was allowed sixty favorable working days after date of beginning (October 23, 1906) for completing his contract. The work has progressed slowly owing to continued interruptions by high water and by steamboats mooring near the wreck. The contractor applied for an extension of time, which was granted by the authority of the Chief of Engineers, June 18, 1907. An expenditure of 90 cents was made for contingent office expenses.

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 CONTRACT IN FORCE.

For removal of wrecked wharf boat (hull *Mayflower*) in Cumberland River, at Nashville, Tenn.:

Contractor: R. L. Johnson.

Date: October 23, 1906.

Consideration: \$700 and material of wreck.

Date of expiration: Sixty favorable working days from date of beginning. (Time limit waived June 18, 1907.)

## APPENDIX D D.

### IMPROVEMENT OF TENNESSEE RIVER AND ITS TRIBUTARIES.

REPORT OF MAJ. WM. W. HARTS, CORPS OF ENGINEERS, OFFICER IN CHARGE, FOR THE FISCAL YEAR ENDING JUNE 30, 1907.

#### IMPROVEMENTS.

- |  |  |
|--|--|
| 1. Tennessee River.  | 4. Clinch, Hiwassee, and Holston rivers, Tennessee and Virginia.           |
| 2. Operating and care of Muscle Shoals Canal, Tennessee River. | 5. Removing sunken vessels or craft obstructing or endangering navigation. |
| 3. French Broad and Little Pigeon rivers, Tennessee.           |  |

ENGINEER OFFICE, UNITED STATES ARMY,  
*Chattanooga, Tenn., July 10, 1907.*

GENERAL: I have the honor to transmit herewith the annual report for the Chattanooga district for the fiscal year ending June 30, 1907.

Very respectfully, your obedient servant,

WM. W. HARTS,  
*Major, Corps of Engineers.*

Brig. Gen. A. MACKENZIE,  
*Chief of Engineers, U. S. A.*

## D D I.

### IMPROVEMENT OF TENNESSEE RIVER.

For the purpose of simplifying the record of appropriations the river has been divided into three sections.

#### 1. ABOVE CHATTANOOGA (188 MILES).

(a) *General improvement.*—Owing to the abnormally high water of 1906, work was abandoned at the close of September. Operations were resumed on June 1, 1907, as soon as the water was low enough to afford a reasonable prospect of a working stage; but during the month a good deal of high water was experienced, making the cost of work two or three times as high as it would have been in a normal season.

The work has been superintended by First Lieut. W. G. Caples, Corps of Engineers, with Superintendent R. B. Thacher and Overseer B. M. Atwood in local charge.

Field operations during the fiscal year were confined to the following localities:

*Shields dam (94 miles above Chattanooga).*—Work was in progress here at the beginning of the fiscal year, and was continued during July, August, and September, 1906, and in June, 1907. A channel was dredged through the obstruction, the lower part of the dam extended 575 feet, and the cross dam at the head about rebuilt. The channel is 150 feet wide and 3 feet deep at average low water. With an ordinary stage of water the work will be finished in 1907.

About 9,135 cubic yards of sand and gravel, at 12 cents per cubic yard, 3,032 cubic yards of cemented sand and gravel, at 26½ cents per cubic yard, and 4,308 cubic yards of cemented rock, sand, and gravel, at 39 cents per cubic yard, were dredged. About 2,925 cubic yards of stone were quarried at a unit cost of 96 cents, and 2,318 cubic yards placed in dams at a unit cost of 51 cents. The total cost, inclusive of field repairs and delays due to high water, amounted to \$10,578.65.

*Caney Creek shoals (98 miles above Chattanooga).*—The work of dredging a channel through the bar at the head of the shoals was commenced in June, 1907. About 2,215 cubic yards of loose material were removed, at a cost of \$342.65, or about 15.4 cents per cubic yard, and 775 cubic yards of rock, at a cost of \$752.85, or about 97 cents per cubic yard.

Under the authority of the Secretary of War special work was carried on at Richland Creek and near Whites Creek shoals for the benefit of the Dayton Coal and Iron Company, the company paying all expenses. At the mouth of Richland Creek about 3,100 cubic yards of soft material and the timbers of two old barges were removed. At the company's landing near Whites Creek shoals 65 cubic yards of gravel and 25 tons of iron ore were taken out by derrick boat *No. 4*, and about 1,475 cubic yards of gravel, sand, and iron ore by the dredge *Kwasind*. The cost of the work was \$1,592.55, all of which was paid by the Dayton Coal and Iron Company. The arrangement was an advantageous one for the United States, as it enabled carrying over the winter a trained force which it would otherwise have been necessary to disband.

The approved project for the expenditure of the appropriation made by the river and harbor act of March 2, 1907, provides for the construction of floating plant at a cost of about \$30,000. Lumber is being purchased and manufactured at Muscle Shoals Canal for this plant. A barge for storing coal was purchased of the Roane Iron Company and is being redecked.

Authority was granted by the Chief of Engineers to lease a garden tract for the purpose of supplying fresh vegetables to employees, this being more economical than purchasing such supplies. A suitable tract of land was rented for the season of 1907 for \$50, with the privilege of renewal at the same price for the calendar year 1908.

The care and repair of the fleet between working seasons amounted to \$3,545.18. Other contingent expenses (supplies, administration, etc.) aggregated \$6,574.41.

Under the direction of Maj. H. C. Newcomer, Corps of Engineers, the cost of the works necessary to carry out the existing project was computed by Lieut. W. G. Caples on the basis of the existing unit

prices. It was estimated by him that the works required would cost \$1,140,000. Since this estimate was made the river and harbor act of March 2, 1907, appropriated \$105,000 toward this work. Of this sum \$1,000 were allotted to the Little Tennessee River by the Secretary of War under the provisions of the act, and \$44,000 will be necessary for plant and maintenance, leaving \$60,000 for works of improvement. This reduces Major Newcomer's estimate for completion to \$1,080,000, exclusive of maintenance.

In the light of experience, there seems to be some question whether the Tennessee River above Chattanooga can ever be satisfactorily improved by regulation so as to provide for a commerce of national importance. The history of the estimates for this work shows that the economy of the system will not be as great as was formerly hoped. To obtain 3 feet at low water from Chattanooga to the head of the river has been estimated as follows: 1871, \$225,000; 1893, \$650,000 in addition to \$296,000 already appropriated, or \$946,000 in all; 1907, \$1,080,000 in addition to \$629,152.85 already appropriated, or \$1,709,152.85 in all.

The main reason for improving the Tennessee River above Chattanooga is to provide an outlet for the mineral products of this section of the Tennessee River, and of the Clinch, Holston, and French Broad rivers, and possibly the Little Tennessee. Mineral products can scarcely be carried with a fair profit when the channel depth is only 3 feet at average low water and 2 feet at extreme low water. For these reasons, even if the work of regulation on the Tennessee River were complete and in successful operation, it seems doubtful whether an all-year commerce of national importance could be developed sufficient to pay interest and sinking-fund charges on the investment.

Whether the prospective commerce on the Tennessee River would justify its canalization so as to provide for boats and tows drawing 6 feet is a subject that is worthy of careful and deliberate study.

#### *Money statement.*

July 1, 1906, balance unexpended.....	\$20, 366. 60
Amount appropriated by river and harbor act approved March 2, 1907.....	105, 000. 00
	<hr/> 125, 366. 60
Allotment for Improving Little Tennessee River.....	\$1, 000. 00
June 30, 1907, amount expended during fiscal year:	
For works of improvement.....	18, 074. 99
For maintenance of improvement.....	4, 518. 75
	<hr/> 23, 593. 74
July 1, 1907, balance unexpended.....	101, 772. 86
July 1, 1907, outstanding liabilities.....	4, 630. 66
	<hr/> 97, 142. 20
Amount (estimated) required for completion of existing project...	<hr/> 1, 080, 000. 00
Amount that can be profitably expended in fiscal year ending June 30, 1909, in addition to the balance unexpended July 1, 1907:	
For works of improvement.....	\$100, 000. 00
For maintenance of improvement.....	5, 000. 00
	<hr/> 105, 000. 00
Submitted in compliance with requirements of sundry civil act of June 4, 1897, and of section 7 of the river and harbor act of 1899.	

## APPROPRIATIONS.

April 10, 1869.....	\$35,000.00	July 13, 1892.....	\$25,000.00
March 3, 1871 (transferred from below Chattanooga).....	35,000.00	August 18, 1894.....	50,000.00
June 10, 1872.....	25,000.00	June 3, 1896.....	15,000.00
March 3, 1873.....	25,000.00	March 3, 1899.....	30,000.00
June 23, 1874.....	25,000.00	June 13, 1902.....	50,000.00
March 3, 1875.....	40,000.00	March 3, 1905.....	50,000.00
August 14, 1876.....	15,000.00	March 2, 1907.....	105,000.00
June 18, 1878.....	15,000.00	Total.....	631,000.00
March 3, 1879.....	11,500.00	Received from other sources.....	152.85
June 14, 1880.....	10,000.00	Total.....	631,152.85
March 3, 1881.....	7,000.00	Transferred to Little Ten- nessee River.....	2,000.00
August 2, 1882.....	7,000.00	Total.....	629,152.85
July 5, 1884.....	3,000.00		
August 5, 1886.....	7,500.00		
August 11, 1888.....	15,000.00		
September 19, 1890.....	30,000.00		

(b) *Little River, Tennessee.*—Under authority of the Secretary of War an allotment of \$1,000 was made from the appropriation of March 2, 1907, for improving the Tennessee River above Chattanooga, to be applied to maintenance on the Little Tennessee River.

Under a like allotment from the appropriation of March 3, 1905, a working party was sent in September, 1906, to the head of Stratton shoals, about 35 miles above the mouth of the river. The work was superintended by Lieut. W. G. Caples, Corps of Engineers, with Overseer B. M. Atwood in local charge.

The dams at Stratton shoals were repaired by placing therein 45 cubic yards of stone. The working party then floated down the river, removing overhanging trees and channel obstructions. The total expense of the work was \$388.32.

The work done was as follows:

Overhanging trees cut.....	372	Overhanging trees girdled.....	4
Overhanging trees trimmed.....	21	Snags removed.....	5
Overhanging limbs removed.....	142		

This work has been of considerable benefit to navigation.

*Money statement.*

July 1, 1906, balance unexpended.....	\$974.31
Amount appropriated by river and harbor act approved March 2, 1907 (allotment).....	1,000.00
	1,974.31
June 30, 1907, amount expended during fiscal year, for maintenance of improvement.....	362.63
July 1, 1907, balance unexpended.....	1,611.68
Amount that can be profitably expended in fiscal year ending June 30, 1909, for maintenance of improvement, in addition to the balance unexpended July 1, 1907.....	
Submitted in compliance with requirements of sundry civil act of June 4, 1897, and of section 7 of the river and harbor act of 1890.	1,000.00

## APPROPRIATIONS.

August 2, 1882.....	\$5, 000
March 3, 1905 (allotment).....	1, 000
March 2, 1907 (allotment).....	1, 000
<b>Total .....</b>	<b>7, 000</b>

## COMMERCIAL STATISTICS.

*Tennessee River above Chattanooga, Tenn.*

Articles.	Year ending December 31, 1906.		Articles.	Year ending December 31, 1906.	
	Quantity.	Estimated value.		Quantity.	Estimated value.
	<i>Tons.</i>			<i>Tons.</i>	
Brick.....	1,140	\$3, 648	Lumber.....	8, 148	\$101, 850
Coal.....	5,406	12, 161	Marble.....	25, 800	258, 000
Fertilizer.....	468	13, 890	Produce.....	2, 256	180, 480
Flour.....	306	15, 250	Railroad ties.....	6, 517	20, 854
General merchandise.....	6,470	1,132, 200	Sand.....	141, 375	94, 250
Grain.....	15, 991	309, 016	Straw.....	884	3, 840
Hay.....	4, 665	98, 300	Tim bark.....	400	3, 000
Iron ore.....	160, 000	240, 000	Wood.....	8, 530	12, 795
Live stock.....	2, 232	223, 200			
Logs.....	85, 434	726, 189	<b>Total.....</b>	<b>475, 515</b>	<b>3, 448, 928</b>

Moved by steamboats and barges, 389,637 tons; by flat boats, 754 tons; in rafts (logs and lumber), 85,124 tons; number of passengers transported, 7,004.

*List of boats and barges navigating the Tennessee River above Chattanooga, Tenn., during the year 1906.*

Name.	Net tonnage.	Barges.		Between what points.	Miles.
		Number.	Tonnage.		
N. B. Forrest.....	134	4	600	(Chattanooga and Kingston.....	104
City of Loudon.....	23	1	50	(Chattanooga and Charleston.....	35
Jane Austin.....	56	8	360	Pinhook and Knoxville.....	116
Catherine P. Lee.....	67			Kingston and Leadvale.....	84
John Rose.....	188	3	1, 200	Dayton Landing and Crescent Mines.....	40
W. T. Gallaher.....	27	2	85	Lenoir and Harriman.....	35
Milnor.....	49	8	290	Above and below Knoxville.....	15
Oliver King.....	42	10	350	Long Island and Caney Creek.....	10
Grady.....	137	4	2, 400	Dandridge and Knoxville.....	4
Brownlow.....	8	1	20		
<b>Total.....</b>	<b>711</b>	<b>41</b>	<b>5, 356</b>		

*Comparative statement of commerce for the past ten years.*

Year.	Amount.	Estimated value.	Year.	Amount.	Estimated value.
	<i>Tons.</i>			<i>Tons.</i>	
1897.....	266, 331	\$2, 693, 802	1902.....	478, 288	\$4, 286, 922
1898.....	218, 378	2, 425, 066	1903.....	562, 258	4, 438, 229
1899.....	269, 552	2, 839, 037	1904.....	562, 677	4, 473, 617
1900.....	380, 697	3, 847, 629	1905.....	486, 406	6, 573, 582
1901.....	294, 607	2, 604, 981	1906.....	475, 515	3, 448, 928

*Little Tennessee River.*

Articles.	Year ending December 31, 1906.		Articles.	Year ending December 31, 1906.	
	Quantity.	Estimated value.		Quantity.	Estimated value.
Moved in rafts:	<i>Tons.</i>		Moved in flatboats—Continued.	<i>Tons.</i>	
Logs.....	2,070	\$17,596	Lumber.....	320	\$4,000
Lumber.....	4,144	51,800	Sand.....	3,750	1,500
Moved in flatboats:			Total.....	10,922	83,056
Grain.....	238	4,760			
Logs.....	400	3,400			

## 2. CHATTANOOGA, TENN., TO RIVERTON, ALA. (238 MILES).

## (A) OPEN-CHANNEL WORK.

This work was superintended by First Lieut. W. G. Caples, Corps of Engineers, with the following assistants in local charge: Engineer James Thompson, Overseer B. M. Atwood, Surveyor J. E. Hall, and Overseer D. W. Shedd.

## BETWEEN HOBBS ISLAND AND GUNTERSVILLE (22 MILES).

Work was resumed between Hobbs Island and Guntersville in September, 1906, and continued until the remainder of the \$15,000 appropriated for that work by the act of March 3, 1905, was exhausted in November.

An unexpended balance of the appropriation of March 3, 1899, for improving Tennessee River between Chattanooga and Riverton (the approved project for which included a provision for this section) becoming available after the passage of the last river and harbor act, was applied to work in this locality. Dredging was resumed in April, 1907, using the dredge *Kentucky* from the lower river, and was continued until May 8, when advantage was taken of a rise in the river to remove the dredge below Colbert shoals to do some needed work at Riverton before beginning operations on the lower river.

Work during the fiscal year was done at the following points, at a total cost of \$8,498.71:

*Browns bar (109 miles below Chattanooga).*—This has been the worst obstruction between Guntersville and Hobbs Island, and consists mainly of cemented gravel. It was greatly improved in 1905 and 1906, but some final work was necessary, and about 12,660 cubic yards of cemented rock were dredged during the season at an average cost of about 10 cents per cubic yard. This has completed the channel to full dimensions, rendering it accessible and safe.

*Allens bar (118 miles below Chattanooga).*—During the fall months of 1906 about 3,500 cubic yards of sand and gravel were removed, at a cost of about 17 cents per cubic yard, and in April and May, 1907, about 10,600 cubic yards at a cost of nearly 13 cents per cubic yard; a total of 14,100 cubic yards, about one-third of which was cemented gravel.



## LITTLE MUSCLE SHOALS.

A tripod was placed at the head of the rock cut above Little Muscle shoals to mark the channel.

In May the dredge *Kentucky* dug and stored at Muscle Shoals Canal a supply of gravel and sand to be used in building concrete piers above the Twin Towheads in Little Muscle shoals. At certain stages of the river boats have to lay a line to assist in passing. This is an operation attended with some danger. The old piles of rock marking the excavated channel have washed down, and new piers will replace them, making the laying of a line easier and safer.

The steamer *Colbert* and a small crew were sent to trim the banks and remove snags below Florence. The work accomplished at the end of the fiscal year consisted of 853 trees cut and 1 snag removed, at a total cost of \$803.45

Under the direction of Maj. H. C. Newcomer, Corps of Engineers, the cost of the works necessary to carry out the project for open-channel regulation in this section was reestimated by Lieut. W. G. Caples, Corps of Engineers, on the basis of existing unit costs. It may be found desirable at an early date to again carefully study this section of the river with a view to ascertaining whether the prospective commerce would not justify the more certain method of improvement by locks and dams.

*Money statement.*

July 1, 1906, balance unexpended.....	\$11, 164. 80
Amount appropriated by river and harbor act approved March 2, 1907.....	205, 000. 00
	<hr/> 216, 164. 80
June 30, 1907, amount expended during fiscal year:	
For works of improvement.....	\$9, 198. 38
For maintenance of improvement.....	292. 18
	<hr/> 9, 490. 56
July 1, 1907, balance unexpended.....	206, 674. 24
July 1, 1907, outstanding liabilities.....	7, 359. 60
	<hr/> 199, 314. 64
July 1, 1907, balance available.....	<hr/> 1, 031, 000. 00
Amount (estimated) required for completion of existing project..	<hr/> <hr/> 1, 031, 000. 00
Amount that can be profitably expended in fiscal year ending June 30, 1909, in addition to the balance unexpended July 1, 1907:	
For works of improvement.....	\$200, 000. 00
For maintenance of improvement.....	5, 000. 00
	<hr/> 205, 000. 00
Submitted in compliance with requirements of sundry civil act of June 4, 1897, and of section 7 of the river and harbor act of 1899.	

## APPROPRIATIONS.

OPEN-CHANNEL WORK AND MUSCLE SHOALS IMPROVEMENT.<sup>a</sup>

March 2, 1827 (survey)-----	\$200. 00	August 18, 1894-----	\$30, 000. 00
June 9, 1860 (claim)-----	1, 350. 00	June 3, 1896-----	50, 000. 00
July 25, 1868-----	85, 000. 00	March 3, 1899-----	35, 000. 00
April 10, 1869-----	5, 095. 00	March 23, 1903 (emer-	
July 11, 1870-----	45, 000. 00	gency river and harbor	
June 10, 1872-----	50, 000. 00	act)-----	6, 000. 00
March 3, 1873-----	100, 000. 00	June 7, 1904 (emergency	
June 23, 1874-----	100, 000. 00	river and harbor act)---	2, 853. 40
March 3, 1875-----	360, 000. 00	March 3, 1905-----	15, 000. 00
August 14, 1876-----	255, 000. 00	March 2, 1907-----	205, 000. 00
June 18, 1878-----	300, 000. 00		
March 3, 1879-----	210, 000. 00	Total-----	3, 992, 998. 40
June 14, 1880-----	300, 000. 00	Received on account of	
March 3, 1881-----	250, 000. 00	transfer settlement-----	3. 91
August 2, 1882-----	250, 000. 00	Refundment of overpay-	
July 5, 1884-----	350, 000. 00	ment-----	24. 30
August 5, 1886-----	262, 500. 00	Receipts from sales-----	906. 87
August 11, 1888-----	250, 000. 00		
September 19, 1890-----	300, 000. 00	Total-----	3, 993, 933. 48
July 13, 1892-----	175, 000. 00		

## (B) HALES BAR LOCK AND DAM (33 MILES BELOW CHATTANOOGA).

General plans for the masonry of this lock and dam were completed in August, 1905, and subsequently approved. The Chattanooga and Tennessee River Power Company submitted plans for the power house and other structures on the left bank, and these were approved by the Secretary of War on August 23, 1905. A contract was then made with the power company, under date of September 12, 1905, for the construction of the lock and dam as authorized by the act of Congress approved April 26, 1904, amended (as to location) by act of January 7, 1905, and a contract bond was furnished in the sum of \$100,000.

Actual work on clearing the ground was begun October 18, 1905. The power company has purchased and deeded to the United States a tract of about 9.1 acres on the right bank to provide the land necessary for the successful construction and operation of the lock and dam. All structures on the left bank pertain to the power plant, and the land there belongs to the power company. Field work has been prosecuted continuously, and at the end of the fiscal year the principal items accomplished were as follows:

*Right bank.*—A sawmill for getting out lumber for various uses was erected and operated. The interlocking steel-pile cofferdam failed and was strengthened with internal struts. It failed again and a crib coffer had to be built all around it and filled with earth, gravel, and quarry spalls. The site of quarry was stripped, quarrying was carried on, and the stone transported on cableways across the river for use in the concrete core wall. Excavation of earth and rock for the site of the land wall of the lock was begun inside the cofferdam.

*Left bank.*—Quarrying was continued about five-eighths of a mile below the dam, and the broken stone was transported to the crusher

<sup>a</sup> The sum of \$3,191,726.50 was expended from these appropriations for the Muscle shoals improvement.

for use in the concrete for the core wall. This quarry was abandoned about June 1. Excavation was continued for the core wall, in which 5,886 cubic yards of concrete were laid, building it to full height for a distance of 421 feet from its hillside end. Excavation for the site of the power house and approaches was continued and the material placed in the earthen embankment. A crib cofferdam to surround the power house and its approaches was begun.

Office work has consisted in making a complete new design of the lock gates, in designing most of the metal work, and in making erection drawings of metal work and of masonry details. The design for the upper gates and for the metal work were approved by the Chief of Engineers December 28, 1906, and contracts have been entered into (1) with the Baltimore Bridge Company to make and erect the upper gates, and (2) with the Atlanta Machine Works to make and deliver the necessary metal work for the lock. Designs for lower lock gates were submitted to the Chief of Engineers for his approval on June 14, 1907.

Cement testing was carried on in the field office for the cement used in the core wall. The brands were Lehigh and Alpha, and the lots were all satisfactory with the exception of two carloads of the former, which were rejected on account of lack of tensile strength.

The total amount of work done by the contractors up to June 30, 1907, is as follows:

	Cubic yards.
Earth excavation .....	* 109, 162
Rock excavation .....	.1, 883
Concrete .....	5, 886

The sum of \$62,970, stated in the Annual Report for 1906 as needed for completion of lock gates, operating machinery, etc., which under the act are to be provided by the Government, was appropriated by the river and harbor act of March 2, 1907.

#### *Money statement.*

July 1, 1906, balance unexpended .....	\$46, 519. 56
Amount appropriated by river and harbor act approved March 2, 1907. ....	62, 970. 00
Proceeds sale of maps .....	18. 29
	<hr/>
	109, 507. 85
June 30, 1907, amount expended during fiscal year for maintenance of improvement .....	5, 445. 97
	<hr/>
July 1, 1907, balance unexpended .....	104, 061. 88
July 1, 1907, outstanding liabilities .....	255. 75
	<hr/>
July 1, 1907, balance available .....	103, 806. 13
	<hr/>
July 1, 1907, amount covered by uncompleted contracts .....	24, 758. 00

\* Of this amount 41,000 cubic yards were excavated during the fiscal year 1906.

## APPROPRIATIONS.\*

March 3, 1905-----	\$10,000.00
June 30, 1906 (sundry civil act)-----	40,000.00
March 2, 1907-----	62,970.00
Total-----	112,970.00
Receipts from sales of maps-----	18.29
Total-----	112,988.29

## (C) COLBERT SHOALS CANAL (8 MILES).

The masonry of the lift lock and its approaches at the lower end of this canal, at Riverton, was begun in 1893 and completed in 1900, according to the project then in force.

Under the act of June 13, 1902, authorizing additional contracts for this work to the amount of \$600,000, a contract was made in May, 1903, with the Sheridan-Kirk Contract Company for building the upper section of the canal, including the construction of a concrete river wall about 10,500 feet long and the excavation of about 57,000 cubic yards of earth and 143,000 cubic yards of rock from the canal trunk. A contract supplemental to this was entered into December 14, 1903, with the object of extending the lower end of the concrete river wall about 1,500 linear feet, thus completing it to the site of the proposed guard lock, by permitting the substitution of a rock-fill dam, with rubble masonry toe wall for about 5,500 feet of the upper end of the wall. A further supplemental agreement was entered into September 29, 1904, permitting the use of concrete not less than 2 feet thick instead of rubble masonry in the toe wall, which is to be built along the line of the omitted concrete wall, having its top at elevation 34. The rock-fill dam is to rise from this toe wall, with a slope not steeper than 1 on 1½, to elevation 42, with a top width of not less than 40 feet, measured from inside of toe wall. The extreme low-water elevation in the canal is assumed at 33.5. A third supplemental agreement was made February 23, 1906, authorizing the contractors to use about 5,000 cubic yards of quarry spalls and other refuse stone belonging to the Government at Keller quarry for the purpose of crushing and pulverizing into sand for concrete, at the rate of 25 cents per cubic yard plus any royalty on the stone so used.

The work done by these contractors during the year was as follows:

	Cubic yards.
Earth and hardpan excavation-----	589,895
Rock excavation-----	33,207
Concrete river wall-----	2,573

When the last annual report was submitted it was expected that this contract, which had been extended from September, 1905, would be practically completed by December 31, 1906. This, however, has not been the case, only about three-fourths of the prescribed work having been so far accomplished.

\*An allotment of \$6,000, made June 30, 1904, from the appropriation for examinations, surveys, and contingencies of rivers and harbors, was expended in making preliminary examinations between Scott Point and Hales bar, and is not included in the appropriations for this improvement.

The excavation of the canal trunk has been carried on by Shippey & Outzen, of Memphis, Tenn., under three contracts covering in all stations 10 to 260, approximately, with a total yardage of about 1,800,000. The contractors began operations November 21, 1905, and were to finish by December 31, 1907; but the progress made indicates that they will be unable to complete their contracts on time. In the course of the work more hardpan was encountered than had been expected, which will increase the estimated cost of the excavation.

The quantities excavated to June 30, 1907, are as follows:

	Earth.	Hardpan.	Rock.
	<i>Cubic yards.</i>	<i>Cubic yards.</i>	<i>Cubic yards.</i>
Stations 10 to 110 .....	469, 894	89, 048	2
Stations 110 to 210 .....	854, 092	54, 090	0
Total .....	823, 986	93, 138	2

The completion of the concrete river wall, with incidental earth and rock excavation, was placed under contract with McGee & Co., of Kansas City, Mo., as stated in last annual report. The contractors began operations May 21, 1906, and were to have finished their work by the end of that year. Owing mainly to unfavorable weather conditions, however, they were unable to make the required progress, and their time for completion was extended for a reasonable period. It is now expected that they will be able to finish their contract by the end of the coming low-water season.

The following work has been done by McGee & Co. up to June 30, 1907:

	<i>Cubic yards.</i>
Earth excavation .....	5, 648
Concrete river wall .....	968

The lift lock at Riverton, and more especially the entrance to it, had become clogged by deposits of mud and debris from the river. These deposits were about 9 feet deep in the lock chamber and from 10 to 20 feet deep in the approach, and had produced a dense growth of willows, some of which were 8 inches in diameter. In May the dredge *Kentucky*, on its way to the lower river, was detained to remove these obstructions. The willows were cut down and the tops dragged out into the river, and a cut was then made by the dredge through the heavy bank by casting the material aside so as to permit the entrance of scows. About 45,800 cubic yards of mud, etc., were removed, at a cost of \$1,167.32, or about 2½ cents per cubic yard.

The river and harbor act of March 2, 1907, appropriated \$200,000 for this canal, and authorized contracts to the additional amount of \$213,000. It is expected that these appropriations will complete the canal. Specifications have been submitted with a view to contracting for the remainder of the excavation, for riprapping about 5 miles of the inner banks of the canal, and for paving the crests of five waste weirs.

*Money statement.*

July 1, 1906, balance unexpended.....	\$541,050.03
Amount appropriated by river and harbor act approved March 2, 1907.....	200,000.00
Amount appropriated by sundry civil act approved March 4, 1907.....	100,000.00
	<hr/>
	841,050.03
June 30, 1907, amount expended during fiscal year, for works of improvement.....	257,529.42
	<hr/>
July 1, 1907, balance unexpended.....	583,520.61
July 1, 1907, outstanding liabilities.....	59,470.57
	<hr/>
July 1, 1907, balance available.....	524,050.04
	<hr/>
July 1, 1907, amount covered by uncompleted contracts.....	369,574.55
Amount (estimated) required for completion of existing project.....	852,000.00
	<hr/>
Amount that can be profitably expended in fiscal year ending June 30, 1909, for works of improvement, in addition to the balance unexpended July 1, 1907.....	
Submitted in compliance with requirements of sundry civil act of June 4, 1897.....	
	213,000.00

## APPROPRIATIONS.

## COLBERT AND BEE TREE SHOALS.

September 19, 1890.....	\$150,000.00	March 2, 1907.....	\$200,000.00
July 13, 1892.....	300,000.00	March 4, 1907 (sundry	
August 14, 1894.....	245,000.00	civil act).....	100,000.00
March 3, 1899.....	100,000.00		
June 13, 1902.....	200,000.00	Total.....	1,995,000.00
March 3, 1903 (sundry		Received from other	
civil act).....	350,000.00	sources.....	16.70
March 3, 1905.....	200,000.00		
March 3, 1905 (sundry		Total.....	1,995,016.70
civil act).....	50,000.00		
June 30, 1906 (sundry			
civil act).....	100,000.00		

## CONTRACTS IN FORCE.

## LOCK AND DAM AT HALES BAR, TENNESSEE RIVER.

1. Contract with Baltimore Bridge Company, of Baltimore, Md., for furnishing and erecting in place the two leaves forming the upper lock gate, for \$14,400. Contract dated March 20, 1907, approved April 19, 1907; expires October 29, 1907.

2. Contract with Atlanta Machine Works, of Atlanta, Ga., for furnishing and delivering certain metal work, for \$10,358. Contract dated March 26, 1907; approved April 27, 1907; expires July 29, 1907.

## COLBERT SHOALS CANAL.

1. Contract with Sheridan-Kirk Contract Company, of Charleston, W. Va., for building section of canal.—Contract dated May 5, 1903, approved May 16, 1903. Supplemental contracts dated December 14, 1903 (approved December 30, 1903), September 29, 1904 (approved October 8, 1904), and February 23, 1906 (approved March 6, 1906). Date of beginning of work, June 20, 1903; date of expiration, September 20, 1905, extended to December 31, 1906.

Prices: Concrete, \$8.28 per cubic yard; earth excavation, 50 cents per cubic yard; rock excavation, \$1.98 and \$2.33 per cubic yard; iron and steel, 7 cents per pound; laying masonry, \$6 per cubic yard; riprap, \$2 per cubic yard; stone backing, \$10 per cubic yard; stone coping, \$24 per cubic yard; face stone, \$16 per cubic yard; special stone, \$24 per cubic yard; timber, \$50 per 1,000 feet B. M.; test holes, 60 cents per linear foot; additional cofferdam required for a portion of the rock-fill dam under supplemental contract, \$2.50 per linear foot.

2, 3, and 4. *Contracts with Shippey & Outzen, of Memphis, Tenn., for excavation of canal trunk.*—The first, covering stations 10 to 110, dated October 12, 1905, approved November 6, 1905; the second, covering stations 110 to 210, dated October 12, 1905, approved November 6, 1905; the third, covering stations 210 to 260, or as far as available funds will go, dated March 12, 1906, approved March 17, 1906. Date of beginning work, November 21, 1905; date of expiration, December 31, 1907. In all three the prices are as follows: Earth, 17.49 cents per cubic yard; hardpan, 50 cents per cubic yard; rock, \$1 per cubic yard.

5. *Contract with McGee & Co., of Kansas City, Mo., for construction of concrete river wall with foundations for bear-trap sluice.*—Contract dated December 11, 1905, approved January 3, 1906. Date of beginning work, May 21, 1906; date of expiration, December 31, 1906; extended for a reasonable period. Prices: Earth excavation, 50 cents per cubic yard; rock excavation, \$3 per cubic yard; concrete, \$8 per cubic yard.

## COMMERCIAL STATISTICS.

*Tennessee River between Chattanooga, Tenn., and Florence, Ala.*

Articles.	Year ending December 31, 1906.		Articles.	Year ending December 31, 1906.	
	Quantity.	Estimated value.		Quantity.	Estimated value.
	<i>Tons.</i>			<i>Tons.</i>	
Brick.....	2,579	\$9,053	Lumber.....	17,237	\$215,462
Coal.....	13,038	29,335	Peanuts.....	300	24,000
Coke.....	2,440	4,270	Produce.....	966	77,280
Cotton.....	7,561	1,510,200	Railroad ties.....	15,834	50,689
Cotton seed.....	2,100	31,500	Sand.....	84,000	56,000
Fertilizer.....	7,200	216,000	Staves.....	25,350	190,125
Flour.....	7,621	381,050	Stone.....	1,059	2,118
General merchandise.....	48,924	6,115,500	Tan bark.....	1,044	7,830
Grain.....	11,744	234,880	Tobacco.....	26	7,800
Hay.....	2,032	40,640	Wood.....	116,276	208,488
Iron, pig.....	985	14,025			
Live stock.....	3,699	369,900	Total.....	413,751	10,146,886
Logs.....	41,796	855,266			

Number of passengers transported, 24,380.

Of the traffic for 1906, 12,474 tons of logs were rafted, and 11,822 passengers and 60,040 tons of freight carried by railway transfer boats between Hobbs Island and Gunter'sville, Ala. (22 miles). Nearly all of the commerce above reported was carried on locally between points within the limits of this section.

*List of boats and barges navigating the Tennessee River between Chattanooga, Tenn., and Florence, Ala., during the year 1906.*

Name.	Net tonnage.	Barges.		Between what points.	Miles.
		No.	Tonnage.		
Chattanooga.....	390			Chattanooga and Paducah.....	464
John A. Patten.....	225				
Joe Wheeler.....	198	4	600	Chattanooga and Decatur.....	160
Sam Davis.....	98				
J. T. Reeder.....	54	1	80	Decatur and Savannah.....	115
Chastang.....	72	4	550	Bridgeport and Decatur.....	110
City of London.....	23	1	60	Decatur and Florence.....	48
C. H. Ackert.....	67				
George Ashley.....	8	9	900	Hales Bar and Subletts Ferry.....	41
Star.....	8				
Sudie.....	11	2	75	Hales Bar and Raccoon Creek.....	35
Buck Lindsay.....	14	3	340	Chattanooga and Oates Island.....	30
City of Charleston.....	92	2	210	Lamb's Ferry and Sheffield.....	27
Meteor.....	14	2	275		
Almande.....	73				
J. R. Gunn No. 2.....	61	16	3,200		
Decatur No. 1.....	48			Decatur and Lamb's Ferry.....	24
White Oak.....	30	5	400		
Columbus.....	6				
T. N. Pearson.....	8	2	125		
Gunter'sville.....	204	3	600	Hobbs Island and Gunter'sville.....	22
Huntsville.....	172				
Parker.....	75	3	450	Chattanooga and Suck Shoals.....	13
Total.....	1,951	57	7,865		

Five of the above boats have not been previously reported as operating on the Tennessee River. Their dimensions are given in the following table:

Name.	Length.	Width.	Depth.	Height of pilot house.	Height of smoke-stack.
	<i>Feet.</i>	<i>Feet.</i>	<i>Feet.</i>	<i>Feet.</i>	<i>Feet.</i>
John A. Patten .....	165.0	32.0	4.5	39.0	47.5
Parker.....	121.0	26.0	4.8	28.0	35.0
C. H. Ackert.....	88.6	18.0	2.9	21.5	28.0
Star <sup>a</sup> .....	50.8	12.0	2.3	14.0	.....
George Ashley <sup>a</sup> .....	.....	.....	.....	14.0	.....

<sup>a</sup> Gasoline boats.

*Comparative statement of commerce for the past ten years.*

Year.	Amount.	Estimated value.	Year.	Amount.	Estimated value.
	<i>Tons.</i>			<i>Tons.</i>	
1897.....	247,422	\$4,078,227	1902.....	137,861	\$5,567,464
1898.....	224,456	3,578,120	1903.....	297,851	7,439,914
1899.....	253,940	6,118,618	1904.....	173,406	7,204,682
1900.....	229,160	5,499,779	1905.....	175,800	9,475,632
1901.....	129,160	4,584,322	1906.....	413,751	10,146,386

3. BELOW RIVERTON, ALA. (226 MILES).

The appropriation of March 3, 1905, for this section of the river was by the terms of the act available only for work in Tennessee. Needed work at points in Kentucky was provided for, however, by an allotment of \$4,700 from the appropriation for emergencies in river and harbor works. Under this allotment the dredge *Kentucky* and its attendant plant, which was wintered at Paducah, Ky., began dredging in August, 1906, at the lower end of the river, taking the most serious obstructions in their upstream order. Channel improvements were made at the following places:

*Head of Tennessee Island (2 miles above Paducah).*—This place was dredged in 1901, but during the low-water period of 1904 it was thought that the channel was being encroached upon near the lower end by a bar from Tennessee Island. A minor survey of the place was made and showed a channel with an available width of 150 feet at low water. The channel was difficult of passage, however, for a boat with a heavy tow. Three cuts were made through the bar, removing about 7,100 cubic yards of gravel and sand, and widening the channel 120 feet. The dredged material was deposited behind the bar, near the island shore.

*Mouth of Guess Creek (16 miles above Paducah).*—The channel opposite the mouth of Guess Creek was obstructed by several projecting points composed of boulders, loose rock of a cherty character, and rock ledges. These were so situated that a very narrow and sinuous passageway was left between them. About 4,300 cubic yards of boulders and rock were taken out, serving to straighten the channel as well as to widen it. The available width at this place is now about 220 feet.

*Little Chain bar (18 miles above Paducah).*—The channel at this place is obstructed by two rock ledges, one projecting from the left shore and the other from a gravel bar in the middle of the river;



both being nearly opposite Government Light No. 503. The gap between these ledges is less than 100 feet wide, and there is over them only a 4-foot depth at low water. While the dredge was here their removal was attempted, but the ledges are composed of a hard, flinty limestone, and the dredge could not break them up. The river being then at a very high stage, blasting was also impracticable, and they were left in this condition for future attention.

The channel below the light was further obstructed by a gravel bar from the left shore, which left a very narrow channel between it and the middle bar. Three cuts were made through the former bar, removing about 5,900 cubic yards of cemented gravel and adding about 120 feet to the channel width.

*Foot of Threemile Island (25 miles above Paducah).*—Here the channel crosses the river, passing through a gap in a bar which extends from the foot of the island to the left shore. This crossing was dredged in 1897, but it had filled again, and in 1904 had given trouble, according to the statements of pilots, who reported that several boats had grounded there. A minor survey made September 1, 1906, indicated a depth of less than  $3\frac{1}{2}$  feet over this crossing at low water.

Operations here were twice interrupted by high water, and the improvement was not completed until September 24. About 39,700 cubic yards were removed, opening a channel 200 feet wide and 6 feet deep at low water. The dredged material was sand and loose gravel, and was deposited near the left shore abreast of the excavation in a series of dams intended to counterbalance the increased sectional area caused by opening the channel.

*Head of Threemile Island (27 miles above Paducah).*—This locality was improved in 1897 by removing a small gravel bar from the middle of the channel just below the Government light on the left shore. The bar, however, has again formed, and the place gave trouble during the low water of 1904. The dredge reached this place September 24, and a minor survey was at once begun, but was interrupted by heavy rains. A considerable rise in the river ensued, necessitating another suspension of work.

No further work could be accomplished under the allotment for improving the Tennessee River in Kentucky, as the funds were exhausted. The plant was therefore moved to Leatherwood shoals, Tennessee.

*Leatherwood shoals (72 miles above Paducah).*—The improvement of this place was undertaken in 1905, but before it was finished a heavy rise in the river caused the suspension of operations for the season. This work was again taken up on October 17, 1906, and to complete the original project two additional cuts were made. About 15,300 cubic yards of cemented gravel were removed and dumped near the left shore, closing the chute behind Leatherwood Island and forming a series of spur dams just abreast of the channel opened, to prevent drawing off water from the pool above and thus affecting the slope. There is now a channel over the crossing 200 feet wide and 6 feet deep at low water.

*Panther Creek Island (60 miles above Paducah).*—The dredge returned to this place after completing the work at Leatherwood shoals, the improvement at the latter place having been first under-

taken for the reason that a high stage, such as prevailed at the time, was needed for the work there in order to dispose economically of the dredged material.

The channel at the head of Panther Creek Island passes down the right shore to a point 200 feet below the Government light, where it was obstructed by a bar composed of cemented gravel underlaid with a stratum of blue mud. During the low water of 1904 this place gave upbound boats a great deal of trouble. In order to keep in the best water it was necessary for them to come up the middle of the chute until the foot of the obstructing bar was reached and then turn sharply toward the right shore. This gave them a cross current on the side, and they were sometimes driven aground on the bar below the light. To improve this locality it was decided to dredge a channel through the bar about normal with the current. Four cuts were made in this direction, opening a channel 160 feet wide and 6 feet deep at low water. The material dredged, which amounted to about 18,300 cubic yards, was deposited near the island abreast of the channel opened.

*Danville (78 miles above Paducah).*—The improvement needed at this place was only partially carried out in 1905; the work that remained to be done consisting of a cut along the shore where the boats coal and a cut near the wharf boat. The cut alongside of the coaling place was made, the excavation amounting to 4,400 cubic yards of loose gravel.

The appropriation having now become practically exhausted, however, work was suspended for the season and the fleet taken to Muscle Shoals Canal for repairs and economical care during the winter.

This work was in local charge of Surveyor J. E. Hall, from whose report the following extract is taken:

The following is a tabulated statement of work done while the dredge was in commission from July 19 to December 3, 1906. The dredge was operated with a double crew until November 8, each crew working eight hours per day, making two eight-hour days of each calendar day. After November 8 a single crew was used.

Time at work:	Days
Dredging gravel and soft material.....	60
Dredging cemented gravel and hard material.....	47
Total .....	107
Time lost:	
Sundays .....	32
Traveling .....	40
High water .....	66
Rain and fogs.....	4
Accidents .....	3
Total .....	145
Time in commission (days of eight hours each).....	252

Nature of work.	Average per day.	Total during season.
	Cub. yds.	Cub. yds.
Loose gravel and soft material excavated.....	1,225	73,500
Cemented gravel and hard material excavated.....	467	21,500
Total.....		95,000

*Summary of expenditures.*

[Dredge in commission.]

Classification.	Per day in com- mission.	Per day of work.	For the season.
Equipment and repairs.....	\$9.59	\$22.58	\$2,416.00
Fuel.....	4.72	11.12	1,190.38
Salaries and subsistence.....	31.95	76.19	8,152.06
Total.....	46.26	109.89	11,758.39

Total cost of dredging each class of material:

Loose gravel and soft material.....	\$6,593.49
Cemented gravel and hard material.....	5,164.90

Total.....	11,758.39
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Cost per unit:

Per cubic yard of loose gravel, etc.....	\$0.089
Per cubic yard of cemented gravel.....	.240
Per cubic yard excavated.....	.124

The above includes cost of repairs made to plant, viz, new roof and smoke-stacks put on the steamer *Lookout* at Paducah and extensive repairs to three dump scows at Muscle Shoals Canal. The unit cost was also greatly increased by the prevalence of high water, much actual time being lost on this account, and the work moreover being greatly retarded by the deep digging, which ranged from 13 to 16 feet below water surface.

In addition to the field cost reported above, expenditures were made for the care of plant, repairs, pay of salaried employees, and other contingencies, amounting to \$4,481.60. Including this sum, the total cost per cubic yard excavated becomes about 17 cents.

In June, 1907, the dredging plant was again taken to the lower river. After making a survey of the obstruction at Chalk Bluff (183 miles above Paducah), the water was found to be too high to permit of economical work at that locality and the plant was moved to Petticoat Ripple (174 miles above Paducah), where about 5,200 cubic yards of gravel, loose and cemented, were dredged before the close of the fiscal year. After completing the work at this place, the most important obstructions will be taken up in downstream order.

*Money statement.*

July 1, 1906, balance unexpended.....	\$18,510.33
Amount appropriated by sundry civil act approved March 4, 1907....	40,000.00
	58,510.33

June 30, 1907, amount expended during fiscal year:

For works of improvement.....	\$552.81
For maintenance of improvement.....	17,598.77
	18,151.58

July 1, 1907, balance unexpended.....	40,358.75
July 1, 1907, outstanding liabilities.....	1,421.21
July 1, 1907, balance available.....	38,937.54

Amount that can be profitably expended in fiscal year ending June 30, 1909, in addition to the balance unexpended July 1, 1907:	
For works of improvement.....	\$36,000.00
For maintenance of improvement.....	14,000.00
	50,000.00
Submitted in compliance with requirements of sundry civil act of June 4, 1897, and of section 7 of the river and harbor act of 1899.	

# 1688 REPORT OF THE CHIEF OF ENGINEERS, U. S. ARMY.

## APPROPRIATIONS AND ALLOTMENTS.

### TENNESSEE RIVER BELOW RIVERTON, ALA.

September 19, 1890.....	\$25,000.00	March 2, 1907.....	\$40,000.00
July 13, 1892.....	25,000.00		
August 18, 1894.....	125,000.00	Total.....	372,197.74
March 3, 1899.....	100,000.00	Received from other	
June 13, 1902.....	19,000.00	sources.....	75.79
June 13, 1902 (allotment).....	3,497.74		
March 3, 1905.....	30,000.00	Total.....	372,273.53
March 3, 1905 (allotment).....	4,700.00		

## COMMERCIAL STATISTICS.

### Tennessee River between Florence, Ala., and Paducah, Ky.

Articles.	Yearending December 31, 1906.		Articles.	Yearending December 31, 1906.	
	Quantity.	Estimated value.		Quantity.	Estimated value.
	<i>Tons.</i>			<i>Tons.</i>	
Brick.....	430	\$1,505	Marble.....	322	\$32,200
Coal.....	1,497	3,368	Peanuts.....	7,780	622,400
Cotton.....	3,650	730,000	Produce.....	1,146	91,680
Cotton seed.....	2,232	33,480	Railroad ties.....	544,606	1,742,419
Fertilizer.....	1,522	45,660	Sand.....	8,750	2,250
Flour.....	5,530	276,500	Staves, spokes, etc.....	25,503	191,272
General merchandise.....	39,807	4,913,375	Tan bark.....	1,209	9,018
Grain.....	16,990	351,600	Telephone poles.....	13,591	113,255
Hay.....	1,474	29,480	Tobacco.....	947	294,100
Live stock.....	5,596	559,600	Wood.....	7,176	12,358
Logs.....	39,920	359,280			
Lumber.....	42,040	525,500	Total.....	766,118	10,930,300

Moved by steamboats and barges, 715,983 tons; rafted (logs and poles), 50,135 tons; number of passengers transported, 23,744.

List of boats and barges navigating the Tennessee River between Florence, Ala., and Paducah, Ky., during the year 1906.

Name.	Net tonnage.	Barges.		Between what points.	Miles.
		Num- ber.	Tonnage.		
Chattanooga.....	390			Chattanooga and Paducah.....	464
I. N. Hook.....	55	8	4,000		
Wilford.....	47				
J. T. Duffy, jr.....	116				
Margaret.....	201				
Pavonia.....	132	71	53,250	Florence and Paducah.....	257
Russell Lord.....	186				
Castalia.....	80				
Inverness.....	121				
Hosmer.....	52				
Henrietta.....	95	7	3,700		
Lyda.....	80	11	5,650		
Klt Carson.....	237	10	6,000		
Martha H. Hennen.....	77	10	2,000		
E. Douglas.....	107	7	3,200		
City of Saltillo.....	372				
Clyde.....	335			Waterloo and Paducah.....	27
City of Memphis.....	322	4	400		
City of Savannah.....	293				
Kentucky.....	191				
Shiloh.....	140				
Charles Turner.....	73	8	4,800	Saltillo and Paducah.....	172
Bernice.....	51	3	1,880	Clifton and Paducah.....	156

*List of boats and barges navigating the Tennessee River, etc.—Continued.*

Name.	Net tonnage.	Barges.		Between what points.	Miles.
		Num- ber.	Tonnage.		
Wabash .....	141	3	1,200	Kellys Landing and Paducah .....	148
Nellie .....	40	1	150	Cuba Landing and Paducah .....	115
J. T. Reeder .....	54	1	80	Decatur and Savannah .....	115
Nellie Willett .....	98	13	3,900	Duck River and Paducah .....	110
Carrie V .....	48				
Monie Bauer .....	45				
Saturn .....	9	2	40	Pine Bluff and Paducah .....	64
Anna H .....	3				
Kuttawa .....	12	1	150		
Total .....	1,243	160	89,900		

Six of the above boats have not been previously reported as operating on the Tennessee River. Their dimensions are shown in the following table:

Name.	Net tonnage.	Length.	Width.	Depth.	Height of pilot house.	Height of smoke- stack.
		<i>Feet.</i>	<i>Feet.</i>	<i>Feet.</i>	<i>Feet.</i>	<i>Feet.</i>
E. Douglas .....	107	112.3	24.2	4.6	30	87.0
Martha H. Hennen .....	77	112.0	23.0	4.8	30	38.5
Bernice .....	51	75.0	18.0	4.0	19	23.0
Carrie V .....	48	100.6	19.1	3.1	22	29.0
Saturn <sup>a</sup> .....	9					
Anna H <sup>a</sup> .....	3					

<sup>a</sup> Gasoline boats.

*Comparative statement of commerce for the past ten years.*

Year.	Amount.	Estimated value.	Year.	Amount.	Estimated value.
	<i>Tons.</i>			<i>Tons.</i>	
1897 .....	890,167	\$5,572,408	1902 .....	1,056,270	\$15,370,604
1898 .....	602,916	8,368,964	1903 .....	848,768	8,720,215
1899 .....	462,307	5,592,720	1904 .....	871,890	18,325,005
1900 .....	1,237,009	6,105,127	1905 .....	663,606	11,091,978
1901 .....	658,102	6,322,450	1906 .....	766,118	10,930,000

## D D 2.

## OPERATING AND CARE OF MUSCLE SHOALS CANAL, TENNESSEE RIVER.

The canal was operated and the locks, canal trunk and embankments, railway, buildings and grounds, and floating plant were cared for during the year. The principal items of work are given in the following statement, which is mainly abstracted from the annual report of Assistant Engineer W. S. Winn, who has continued in local charge of the canal:

## LOCKS.

At Locks 7 and 9 the old wood frames upon which the drop gates rest when down and which carry most of the maneuvering apparatus were replaced two or three years ago with steel frames and have since given a minimum amount of trouble. The other drop gates, at Locks

5, 6, and 8 should be improved in a similar manner as soon as low water in the river suspends the more important traffic through the canal. By using concrete-steel posts and beams (the steel for which can be obtained from the scrap pile), these changes could be made at a cost of about \$500 for each lock.

At Locks 6, 7, 8, and 9, leakage between the ends of drop gates and lock walls, due to wearing away of the stone, had become so great as to impair the easy handling of the gates. This was remedied by letting steel plates into the walls at the ends and to full height of the drop gates. This will also have to be done at Lock 5.

At the lower gates, especially at Lock B, leakage has developed and is rapidly increasing between the lower third of the heel posts and the hollow quoins. It is proposed to stop this leakage by facing the hollow quoins with cast-iron plates of the proper shape.

Minor repairs were made as follows:

*Lock A.*—Repaired the spar platform, painted the gates, removed logs from the valves twice, and mud from behind the gates once.

*Lock B.*—Repaired the spar platforms and the valve covers and painted the gates.

*Lock 1.*—Put new miter posts in the lower gates, repaired the valve covers, and scraped and painted the gates.

*Lock 2.*—Scraped and painted the gates, repaired the valve covers, and removed logs from the valves twice.

*Lock 3.*—Scraped and painted the gates, repaired the valve covers, and put pins in one valve shaft.

*Lock 4.*—Repaired the valve covers and cleaned mud from behind the gates.

*Lock 5.*—Made two new rack bars, put in bevel gear, and straightened the shaft of the drop-gate maneuvering apparatus; put pins in one valve shaft, painted the valve covers, and repaired the spar platforms and valve covers.

*Lock 6.*—Repaired the spar platforms, valve covers, and rack arm of lower gate maneuvering apparatus; rebuilt the dry wall at the upper end of the lock; repaired the drop-gate maneuvering apparatus.

*Lock 7.*—Repaired the spar platforms and valve covers and removed logs from the valves.

*Lock 8.*—Repaired the spar platforms and valve covers; put new miter posts in the lower gates and adjusted the rack and pinion of the drop gate.

*Lock 9.*—Repaired the spar platforms and valve covers and rebuilt about half of the timber training wall at the lower entrance.

The total expense for the operation and care of the 11 locks during the fiscal year was \$8,191.57.

#### CANAL TRUNK AND EMBANKMENTS.

Drift was cleared from the longitudinal dam above Lock A for its entire length on one occasion, and after every rise it was necessary to remove some drift and snags. An unusually heavy run of drift occurred in November, packing the entrance to the upper division. Three days were required to remove it. A heavy drift run also occurred in the head of the lower canal, but it is never a serious problem to dispose of it there.

Ditches were opened between Locks A and B; also just above Lock 6, where the dredge had cast mud over the embankment, and along the line between the land of W. A. Barlow and the strip recently acquired from him by the United States. Earth from the latter ditch was thrown up into a low levee to prevent the dredged mud from flowing beyond the Government right of way.

Leaks appeared in several places in both divisions of the canal. In the long level between Locks 5 and 6 leaks caused the top of the embankment to cave in nearly every month. Stone and clay were distributed along the embankment at the worst places for use in preventing leaks. Ever since the hydraulic power plant at Lock A was dispensed with and the power-house pit filled leaks have existed along the line of culverts that formerly ran through the power house. These culverts were lined with timber, which rotted away and on one occasion permitted the superimposed earth to fall in. Leakage carried the earth away and increased until a considerable volume of water was passing, when it was discovered and remedied.

Gaps in the crest of the dam above Lock A were repaired with stone quarried for the purpose. The banks above Lock A being very low, a timber revetment was built along the water's edge to hold back the mud thrown out by the dredge.

The dry wall from Lock 3 wing wall to the abutment of Bluewater dam was rebuilt, making it a vertical-faced retaining wall of ample section to withstand the pressure against it. Valves in Bluewater and Six-Mile dams were repaired.

Other minor repairs were made and weeds and bushes kept cut along the embankments.

*Dredging.*—The dredge *Alabama* was under repair during September, October, and November, and again in February, and no dredging was done in those months. The year's work embraced complete dredging from the pier to the drift sluice gate, from the head of the lower canal to Lock 1, and from Six-Mile Creek to Lock 6, and occasional dredging wherever needed all along the lower division. About 111,337 cubic yards of mud were removed at an average cost of about 2.3 cents for all expenses in the field. Adding the cost of repairs when the dredge was not in commission, the average cost of dredging becomes about 4.1 cents per cubic yard.

The total expenses for maintenance of the 18 miles of canal trunk and embankments amounted to \$10,961.20, or an average of \$608.95 per mile.

#### RAILWAY.

The bridge over Six-Mile Creek was repaired, and the abutments of two bridges on the Y track were rebuilt. The work of renewing ties, surfacing, lining, and tamping track, tightening joints, keeping down the grass and weeds, etc., was carried on from time to time. Repairs to rolling stock were made as needed.

The length of track is 16 miles, including sidings, and its total cost of maintenance was \$3,851.50, or about \$240.72 per mile. The number of miles run by engines was 16,200, at an average cost of 10.1 cents per engine-mile. The total cost for maintenance and operation of the railway was \$7,459.03.

#### BUILDINGS AND GROUNDS.

There are 40 buildings at the canal, not including the smaller out-buildings. No new buildings were added during the year.

*Minor improvements and repairs.*—The following buildings were painted outside: White and negro quarters and all other buildings

in the grounds at Lock 6, except assistant engineer's quarters, overseer's quarters, and barn; sawmill and carpenter shop, property house, hand-car house, lockman's house at Lock 6, and lockmaster's house at Lock 5.

At Lock A the walls of the lockmaster's house were rebuilt, a concrete floor put in the cellar, and fireplaces, windows, and floors repaired. Fireplaces were repaired and one room was painted in the lockman's house.

At Lock B the hearths and fireplaces in lockmaster's house were repaired, and the interior of the house was painted throughout.

At Lock 4 windows were repaired in the lockmaster's house, and the lower story in the lockman's house was ceiled.

At Lock 6 a hot-air heating plant was installed in assistant engineer's quarters; pipes and fixtures in the bathroom were repaired, three rooms and two porches were painted, blinds repaired, etc. Three rooms in overseer's quarters were painted, all the floors stained, doors and blinds repaired, and two new doors made. In the office and quarters building the bedroom and offices were painted, and a new sitting room for employees was provided on the upper floor, while the room formerly set apart for this purpose was arranged for use as a drafting room and place to store records, after connecting it with the office by a new doorway. The boathouse, car shed, and hand-car house were given minor improvements and repairs. New posts were put under the sawmill and carpenter shop, and the roof was repaired and painted. The blacksmith shop was given a new shingle roof over its boiler room, and a corrugated-iron roof was put on the main shop and foundry.

At Lock 8 a new shingle roof was put on the lockman's house.

At Lock 9 the kitchen and storeroom of the lockmaster's house were repaired and painted, and the lockman's house was given a new shingle roof.

A new automatic gate and turnstile was installed at entrance to the grounds at Lock 6; the road from Lock 6 to the Huntsville road was repaired; trees were trimmed and grass and weeds cut; fences, water pipes, etc., repaired.

The total cost of maintenance of buildings and grounds for the fiscal year amounted to \$4,396.53.

#### FLOATING PLANT.

*Steamer Colbert.*—The boat was docked and repairs were made to sides and stern, roof, deck, steam-heating system, pipe lines (many of which were renewed), capstan, pump, doctor, etc. The old wheel was repaired, and later a new one was built, 10 inches less in diameter and with buckets 20 inches wide instead of 17 inches as in the old one. The roof, pilot house, guard rims, lower bulkheads, and hull were painted. New packing rings, metal-lined oil locker, walkways on roof, ladder, fire appliances, grates, and furnace-door liners were made.

*Steamer Kingman.*—The repairs made to this boat included rebuilding the sprocket chains, making and putting on 6 new sprocket wheels, welding the wheel shaft, building a new wheel, making new wheel flanges and grate bars, painting the hull, deck, and roof, putting



in 6 new flues, etc. Other minor repairs were made by the crew when the boat was not running.

*Dredge Alabama.*—The dredge was in the dock for general repairs in the fall of 1906. It was completely dismantled, and repairs were made to stern spud frame, buckets, ladder, pump, spuds and spud rigging, siphon, tumblers, etc. A new ash well and floor in boiler room were put in. Two sections were added to the smokestack, new pins and bushings were made, and bucket and link connections repaired. The dredge was painted all over and calked wherever needed.

The dry dock and Government shops at Lock 6 were also used in repairing the steamer *McPherson*, dredge *Kwasind*, and other floating plant pertaining to the general improvement of the river, the cost of such repairs being paid from the different appropriations to which the plant belongs. Authority was given to construct a quarter boat for use on the Cumberland River, to be transferred to that work at actual cost of construction (limited to \$3,000). In addition to this, authority was granted to construct at the canal shops a number of pieces of floating and other plant to be used on different sections of the Tennessee River, viz, 1 towboat, 11 barges, 2 derrick boats, 4 quarter boats, 1 quarry boat, 1 drill tender, 1 drill raft, 1 floating boathouse, and 235 scale boards, at a total estimated cost of \$75,550. It is also proposed to have new hulls for the dredges *Kentucky* and *Kwasind* built at the canal.

#### SHOPS.

The sawmill, planing mill, carpenter shop, blacksmith shop, machine shop, and foundry were operated from time to time as required, and necessary repairs made thereto. The circular sawmill has become worn out, and authority was granted to replace it by a band mill. This was ordered and will be installed early in the coming fiscal year. About 121,078 feet B. M. were sawed, at an average cost of \$2.81 per thousand, and 158,533 feet B. M. planed, at an average cost of \$1.67 per thousand.

In the iron foundry 26 runs were made, charged with an aggregate of 10,658 pounds of pig iron, 16,435 pounds of scrap, and 14,992 pounds of coke. Castings aggregating 20,061 pounds were made, at an average cost for labor and material of  $1\frac{1}{4}$  cents per pound. In 10 runs of brass there were made 67 castings, weighing in all 525 pounds, at an average cost of  $16\frac{1}{4}$  cents per pound in the rough.

Some work was done in getting out metal parts for the bear trap drift sluice for Colbert Shoals Canal, the cost of which was paid from the appropriation for that work.

#### LAND.

Under authority granted for the purchase of land, as stated in the last annual report, four tracts were purchased lying along the south side of the canal and containing an aggregate of  $26\frac{1}{2}$  acres, at a cost of \$50 per acre, or \$1,325 in all. These tracts comprise about 45 per cent of the entire strip, extending 100 feet south of the towpath, which it was proposed to acquire for use as a dumping ground for the material periodically dredged from the canal trunk. The other owners have so far declined to accept the price offered by the United States.

## OFFICE AND ADMINISTRATION.

This includes the local office supplies and superintendence, amounting to \$4,459.36, and a share of the Chattanooga office expenses, amounting to \$1,448.41, giving a total of \$5,907.77.

## MISCELLANEOUS EXPENSES AND CONTINGENCIES.

This includes all items of expense that can not readily be classified under the former headings, such as miscellaneous supplies, care and forage of mules, tools and appliances for general use, lights, etc., amounting in all to \$7,611.16.

The allotment for the fiscal year ending June 30, 1907, was found inadequate to cover the necessary expenses of operating and care of the canal, and on June 14 an additional allotment of \$6,000 was made to cover the deficiency.

## ALLOTMENTS.

November 28, 1890.....	\$40,000.00	April 12, 1902 (to repair storm damage).....	\$30,000.00
July 1, 1891.....	31,792.04	July 1, 1902.....	60,529.19
July 1, 1892.....	45,232.90	August 7, 1902 (to rebuild hull of dredge).....	8,000.00
July 1, 1893.....	60,975.19	November 6, 1902 (to purchase land).....	1,200.00
July 1, 1894.....	63,772.63	July 1, 1903.....	61,016.78
July 1, 1895.....	64,793.11	May 23, 1904 (to purchase land).....	605.00
July 1, 1896.....	62,707.46	July 1, 1904.....	61,920.78
July 1, 1897.....	67,979.53	July 1, 1905.....	47,391.46
July 1, 1898.....	62,868.17	July 1, 1906.....	44,063.92
July 1, 1899.....	59,239.20	June 14, 1907 (to cover deficiency).....	6,000.00
July 1, 1900.....	63,000.00		
July 20, 1900 (to cover deficiency).....	355.95	Total.....	1,010,873.98
November 2, 1900 (to repair dam above Lock A).....	4,500.00		
July 1, 1901.....	62,930.65		

*Estimate of funds needed from appropriation for operating and care of canals and other works of navigation (indefinite) to be applied to current expenses in operating the Muscle Shoals Canal from July 1, 1907, to June 30, 1908.*

Amount required for fiscal year ending June 30, 1908.....	\$65,000.00
Balance remaining from allotments of preceding year.....	807.49

Additional allotment needed for fiscal year ending June 30, 1908.....	64,192.51
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*Summary of expenditures for operating and care of Muscle Shoals Canal for the fiscal year ending June 30, 1907.*

Office and administration.....	\$5,907.77
Maintenance and operation of locks.....	8,191.57
Maintenance of canal trunk and embankment.....	10,961.20
Maintenance and operation of railway.....	7,459.03
Maintenance of buildings and grounds.....	4,396.53
Maintenance of floating plant.....	8,236.02
Miscellaneous expenses and contingencies.....	7,611.16

Total.....	52,763.28
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## COMMERCIAL STATISTICS.

*Statement of traffic through the Muscle Shoals Canal during the calendar year 1906.*

Articles.	Quantity.	Estimated value.	Articles.	Quantity.	Estimated value.
	<i>Tons.</i>			<i>Tons.</i>	
Brick .....	92	\$276	Livestock .....	100	10,000
Coal .....	287	789	Logs .....	1,985	16,873
Cotton .....	1,788	356,600	Lumber .....	1,855	23,188
Cotton seed .....	2,006	50,125	Machinery .....	135	33,750
Farm implements .....	126	18,900	Railroad ties .....	5,908	18,905
Farm produce .....	217	17,360	Staves .....	6,508	81,288
Fertilizer .....	949	28,470	Tobacco .....	12	3,600
Flour .....	127	6,350	Wood .....	109	191
General merchandise .....	2,996	374,500			
Grain .....	1,830	26,600	Total .....	26,878	1,074,945
Hay .....	359	7,180			

The above is exclusive of supplies carried by Government steamers.

Number of passengers carried, 3,654; number of lockages made, 2,483.

*List of boats and barges using the Muscle Shoals Canal during the calendar year 1906.*

Name.	Net tonnage.	Barges.		Number of trips made.	Total trips of barges.
		Number.	Tonnage.		
Almande .....	73	2	350	6	6
American .....	158	2	400	1	2
Chattanooga .....	390			88	
City of Charleston .....	92	2	210	43	9
City of London .....	28	1	60	7	8
Columbus .....	6	5	400	61	67
Decatur No. 1 .....	48	3	700	75	79
J. R. Gunn No. 2 .....	61	3	575	89	88
J. T. Reeder .....	54	3	160	31	6
Meteor .....	14	2	275	35	30
T. N. Pearson .....	8	2	125	10	8
White Oak .....	30	3	310	90	51

*Comparative statement of commerce for the past ten years.*

Year.	Amount.	Estimated value.	Year.	Amount.	Estimated value.
	<i>Tons.</i>			<i>Tons.</i>	
1897 .....	5,119	\$88,565	1902 .....	7,712	\$577,506
1898 .....	10,264	284,081	1903 .....	10,571	712,150
1899 .....	14,819	295,003	1904 .....	10,560	559,002
1900 .....	14,881	297,894	1905 .....	17,796	759,100
1901 .....	11,925	592,634	1906 .....	26,878	1,074,945

## D D 3.

## IMPROVEMENT OF FRENCH BROAD AND LITTLE PIGEON RIVERS, TENNESSEE.

A small party was sent to the French Broad River in August, 1906, and the work, which was considerably impeded by high water, was continued into September. The party started in at Dandridge, Tenn.

*Fains shoals.*—A break in the dam at the head of Fains Island was repaired with about 15 cubic yards of quarried stone.

*Red Bank shoals.*—The bank protection at this locality was repaired with 73 cubic yards of stone quarried for the purpose, 55 hewn timbers, and 500 feet B. M. of plank.

*Wesley Chute.*—About 50 cubic yards of stone was quarried and used to repair the dam at the head of the chute.

In addition to the above operations, 3 snags were removed from the channel and 2 overhanging trees were cut.

The total cost of the work was \$647.83.

Under authority granted by the Chief of Engineers, a quarter boat belonging to this improvement was transferred to Muscle Shoals Canal for \$500.

#### *Money statement.*

July 1, 1906, balance unexpended.....	\$2, 043. 43
Amount appropriated by river and harbor act approved March 2, 1907.....	2, 000. 00
Proceeds transfer of quarter boat.....	500. 00
	<hr/> 4, 543. 43
June 30, 1907, amount expended during fiscal year, for maintenance of improvement.....	515. 64
July 1, 1907, balance unexpended.....	4, 027. 79
July 1, 1907, outstanding liabilities.....	126. 19
July 1, 1907, balance available.....	<hr/> 3, 901. 60
Amount (estimated) required for completion of existing project.....	<hr/> 61, 515. 64
Amount that can be profitably expended in fiscal year ending June 30, 1909, in addition to the balance unexpended July 1, 1907:	
For works of improvement.....	\$18, 000. 00
For maintenance of improvement.....	2, 000. 00
	<hr/> 20, 000. 00
Submitted in compliance with requirements of sundry civil act of June 4, 1897, and of section 7 of the river and harbor act of 1899.	

#### APPROPRIATIONS.

June 14, 1880.....	\$10, 000. 00	March 3, 1899.....	\$5, 000. 00
March 3, 1881.....	3, 500. 00	June 13, 1902.....	15, 000. 00
August 2, 1882.....	5, 000. 00	March 3, 1905.....	2, 000. 00
July 5, 1884.....	3, 500. 00	March 2, 1907.....	2, 000. 00
August 5, 1886.....	6, 000. 00		
August 11, 1888.....	10, 000. 00		99, 000. 00
September 19, 1890.....	10, 000. 00	Receipts from sales.....	501. 96
July 13, 1892.....	15, 000. 00		
August 18, 1894.....	7, 000. 00	Total.....	99, 501. 96
June 3, 1896.....	5, 000. 00		

## COMMERCIAL STATISTICS.

*French Broad River, Tennessee.*

Articles.	Year ending December 31, 1906.		Articles.	Year ending December 31, 1906.	
	Quantity.	Estimated value.		Quantity.	Estimated value.
	<i>Tons.</i>			<i>Tons.</i>	
Brick.....	136	\$435	Lumber.....	5,570	\$69,625
Coal.....	215	484	Marble.....	24,750	247,500
Fertilizer.....	113	3,390	Produce.....	1,277	102,160
Flour.....	59	2,950	Railroad ties.....	17	55
General merchandise.....	1,624	203,000	Sand.....	90,000	60,000
Grain.....	5,384	107,680	Straw.....	215	2,150
Hay.....	2,275	45,500	Wood.....	5,930	8,895
Live stock.....	1,192	119,200	Total.....	139,157	976,424
Logs.....	400	8,400			

Rafted (logs and lumber), 1,200 tons.

*List of boats and barges navigating French Broad River during the year 1906.*

Name.	Net tonnage.	Barges.		Between what points.	Miles.
		No.	Tonnage.		
Jane Austin.....	86				
Catherine P. Lee.....	67	8	360	Leadvale and Kingston.....	70
Brownlow.....	8	1	20	Dandridge and Knoxville.....	47
Oliver King.....	42	10	350	Marble quarries and below Knoxville.....	5
Milnor.....	49	8	290	Paint Rock and below Knoxville.....	4
Total.....	252	27	1,020		

*Comparative statement of commerce for the past ten years.*

Year.	Amount.	Estimated value.	Year.	Amount.	Estimated value.
	<i>Tons.</i>			<i>Tons.</i>	
1897.....	70,756	\$617,255	1902.....	157,819	\$1,810,772
1898.....	124,960	928,361	1903.....	102,076	1,089,453
1899.....	102,263	779,705	1904.....	258,847	2,129,246
1900.....	160,827	1,225,677	1905.....	188,700	1,599,587
1901.....	103,340	922,032	1906.....	139,157	976,424

## D D 4.

IMPROVEMENT OF CLINCH, HIWASSEE, AND HOLSTON RIVERS,  
TENNESSEE.

## (A) CLINCH RIVER.

No work was done during the fiscal year. The expenditures were for liabilities incurred in June, 1906, removing obstructions and repairing dams. It is expected to send out a small party the coming season for the purpose of continuing the work of maintenance.

This river and its tributaries are the chief source of the prospective traffic in mineral products on the Tennessee River. Their valleys contain most of the coal and zinc and some of the iron and marble of the Tennessee River system.

The improvement of the Clinch River should therefore be of the same class as that of the Tennessee River above Chattanooga. It is apparently well adapted to canalization. No commerce, aside from rafting, will result along this stream until an adequate improvement is installed. The profitable handling of the mineral products requires that the improvement shall provide for boats and tows drawing 6 feet.

The Emory River to the town of Harriman might properly be considered as part of the Clinch River for purposes of improvement.

*Money statement.*

July 1, 1906, balance unexpended.....	\$1, 480. 48
Amount appropriated by river and harbor act approved March 2, 1907, allotment.....	325. 43
	<hr/> 1, 805. 91
June 30, 1907, amount expended during fiscal year, for maintenance of improvement.....	305. 91
	<hr/> 1, 500. 00
July 1, 1907, balance unexpended.....	1, 500. 00
July 1, 1907, outstanding liabilities.....	28. 84
	<hr/> 1, 471. 16
<hr/>	
{ Amount that can be profitably expended in fiscal year ending June 30, 1909, for maintenance of improvement, in addition to the balance unexpended July 1, 1907.....	1, 000. 00
{ Submitted in compliance with requirements of sundry civil act of June 4, 1897, and of section 7 of the river and harbor act of 1899.	

APPROPRIATIONS.

June 14, 1880.....	\$10, 000. 00	March 3, 1899.....	\$8, 500. 00
March 3, 1881.....	3, 000. 00	June 13, 1902 (allotment).....	3, 000. 00
August 2, 1882.....	3, 000. 00	March 3, 1905 (allotment).....	1, 500. 00
July 5, 1884.....	5, 000. 00	March 2, 1907 (allotment).....	325. 43
August 5, 1886.....	5, 000. 00		<hr/> 54, 825. 43
August 11, 1888.....	5, 000. 00	Receipts from sales.....	1. 10
September 19, 1890.....	4, 000. 00		<hr/> 54, 826. 53
July 13, 1892.....	4, 000. 00		
August 18, 1894.....	2, 500. 00	Total.....	

COMMERCIAL STATISTICS.

Articles.	Year ending Dec. 31, 1906.		Articles.	Year ending Dec. 31, 1906.	
	Quantity.	Estimated value.		Quantity.	Estimated value.
	<i>Tons.</i>			<i>Tons.</i>	
Brick.....	286	\$915	Lumber.....	4, 284	\$53, 550
Coal.....	405	911	Produce.....	2, 181	174, 480
Fertilizer.....	443	18, 290	Railroad ties.....	250	800
Flour.....	259	12, 950	Sand.....	5, 625	8, 750
General merchandise.....	6, 284	785, 500	Straw.....	384	8, 840
Grain.....	11, 814	236, 280	Tan bark.....	400	8, 000
Hay.....	2, 915	58, 300	Wood.....	6, 430	11, 452
Live stock.....	2, 232	223, 200			
Logs.....	68, 092	578, 782	Total.....	112, 284	2, 161, 130

Logs rafted, 67,342 tons.

*List of boats and barges navigating Clinch River during the year 1906.*

Name.	Net tonnage.	Barges.		Between what points.	Miles.
		No.	Tonnage.		
W. T. Gallaher .....	27	2	85	Lenoir and Harriman .....	4.5
Catherine P. Lee .....	67	8	360	Leadvale and Kingston .....	.8
Jane Austin .....	86	4	600	Chattanooga and Kingston .....	.8
N. B. Forrest .....	135				
Total .....	315	14	1,045		

*Comparative statement of commerce for the past ten years.*

Year.	Amount.	Estimated value.	Year.	Amount.	Estimated value.
	<i>Tons.</i>			<i>Tons.</i>	
1897 .....	102,629	\$908,238	1902 .....	129,925	\$2,272,348
1898 .....	160,345	865,759	1903 .....	161,716	2,847,872
1899 .....	186,691	2,391,624	1904 .....	100,701	1,930,686
1900 .....	132,511	1,462,294	1905 .....	126,800	4,738,303
1901 .....	164,566	1,683,103	1906 .....	112,284	2,161,130

## (B) HIWASSEE RIVER.

Field operations were carried on at two localities.

*Mathews shoals (9 miles above the mouth).*—Work was commenced here in October, 1906, and carried on through November, when the fleet was laid up for lack of funds. About 2,005 cubic yards of stone were quarried and placed in the dams, and about 290 cubic yards were removed from the old works. The water has not been low enough to complete this work, but boats now pass at all times, while formerly the passage of the shoals was attempted only in the day-time.

The cost of this work, including the expense of moving the fleet, was \$3,096.20.

*Blackbird shoals (17 miles above the mouth).*—Work was commenced in April and carried on until the middle of June, 1907. A channel 150 feet wide and 2½ feet deep was dredged through the upper shoals and one cut was made on the crossing of the lower shoals. The old dam at the head of the shoals extending out from the right bank was removed, and a longitudinal dam and two tie dams were built on the left bank below the old structure, which was repaired. The work done comprised the cutting of 25 overhanging trees, the dredging of 875 cubic yards of rock and 5,745 cubic yards of sand and gravel, the quarrying of 2,880 cubic yards of stone, and the placing of 2,914 cubic yards of stone and calking on dams; at a total cost of \$5,307.04.

The construction of a suitable plant for work on this river has been authorized by the Chief of Engineers, and the necessary lumber for the purpose is now being collected at Muscle Shoals Canal.

*Money statement.*

July 1, 1906, balance unexpended		\$4, 460. 80
Amount appropriated by river and harbor act approved March 2, 1907 (allotment)		55, 282. 40
		<u>59, 743. 20</u>
June 30, 1907, amount expended during fiscal year:		
For works of improvement	\$7, 952. 00	
For maintenance of improvement	1, 987. 96	
		<u>9, 939. 96</u>
July 1, 1907, balance unexpended		49, 803. 24
July 1, 1907, outstanding liabilities		1, 153. 77
		<u>48, 649. 47</u>
Amount that can be profitably expended in fiscal year ending June 30, 1909, for maintenance of improvement, in addition to the balance unexpended July 1, 1907		9, 000. 00
Submitted in compliance with requirements of sundry civil act of June 4, 1897, and of section 7 of the river and harbor act of 1899.		

## APPROPRIATIONS.

August 14, 1876	\$10, 000. 00	September 19, 1890	\$1, 500. 00
June 13, 1878	10, 000. 00	June 13, 1902 (allotment)	10, 000. 00
March 3, 1879	3, 000. 00	March 3, 1905 (allotment)	4, 500. 00
June 14, 1880	3, 000. 00	March 2, 1907 (allotment)	55, 282. 40
March 3, 1881	1, 500. 00		<u>106, 282. 40</u>
August 2, 1882	1, 500. 00	Receipts from sales	8. 23
July 5, 1884	2, 500. 00		
August 15, 1886	2, 500. 00	Total	<u>106, 290. 63</u>
August 11, 1888	1, 000. 00		

## COMMERCIAL STATISTICS.

Articles.	Year ending December 31, 1906.		Articles.	Year ending December 31, 1906.	
	Tons.	Estimated value.		Tons.	Estimated value.
Flour	30	\$1, 500	Produce	186	\$10, 880
General merchandise	665	83, 125	Railroad ties	250	800
Grain	822	16, 440	Straw	80	300
Hay	75	1, 500	Tan bark	200	1, 500
Live stock	75	7, 500			
Logs	80	680	Total	3, 563	139, 225
Lumber	1, 200	16, 000			

Number of passengers transported, 200.



## (c) HOLSTON RIVER.

At the beginning of the fiscal year a working party was organized and descended the river in two temporary boats built for the purpose. At Cloud shoals the dam was repaired with 13 cubic yards of stone taken from the channel. At Poor Valley shoals 226 yards of quarried stone and stone taken from the river bed were placed on the dams. On the way down 83 trees were cut and 16 trimmed and topped.

*Money statement.*

July 1, 1906, balance unexpended.....	\$1, 386. 34
Amount appropriated by river and harbor act approved March 2, 1907 (allotment).....	1, 017. 17
	<hr/>
	2, 403. 51
June 30, 1907, amount expended during fiscal year, for maintenance of improvement.....	903. 51
	<hr/>
July 1, 1907, balance unexpended.....	1, 500. 00
	<hr/>
Amount (estimated) required for completion of existing project.....	1, 500. 00
	<hr/>
{ Amount that can be profitably expended in fiscal year ending June 30, 1909, for maintenance of improvement, in addition to the balance unexpended July 1, 1907.....	1, 000. 00
{ Submitted in compliance with requirements of sundry civil act of June 4, 1897, and of section 7 of the river and harbor act of 1899.	

## APPROPRIATIONS.

June 13, 1902 (allotment).....	\$5, 000. 00
March 2, 1907 (allotment).....	1, 017. 17
	<hr/>
Total.....	6, 017. 17

## COMMERCIAL STATISTICS.

Articles.	Year ending December 31, 1906.	
	Quantity.	Estimated value.
Logs (rafted) .....	Tons. 19, 800	\$168, 800

## D D 5.

## REMOVING SUNKEN VESSELS OR CRAFT OBSTRUCTING OR ENDANGERING NAVIGATION.

In January, 1907, it was reported that a barge (unnamed) belonging to Tuthill & Patteson, of Sheffield, Ala., had been sunk in the Tennessee River between Sweetwater bar and the railroad bridge at Florence, Ala. The channel at this place is quite narrow, and as soon as the obstruction was reported the owners were requested to remove it. Upon their failure to do so within a reasonable time the matter was reported, and an allotment of \$500 was made for the purpose under authority of section 20 of the river and harbor act approved March 3, 1899.

The U. S. steamers *Lookout* and *Kingman*, assisted by two packet boats, endeavored to haul the barge out of the channel. It was too firmly embedded, however, to be removed as a whole, and the use of explosives was resorted to. By this method the channel was cleared of the wreck at a cost of \$109.15.

## APPENDIX E E.

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IMPROVEMENT OF OHIO RIVER BY OPEN-CHANNEL WORK AND CONSTRUCTION OF LOCK AND DAM NO. 37—OPERATING SNAG BOATS ON OHIO RIVER BELOW THE PENNSYLVANIA STATE LINE.

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REPORT OF LIEUT. COL. WM. T. ROSSELL, CORPS OF ENGINEERS, OFFICER IN CHARGE, FOR THE FISCAL YEAR ENDING JUNE 30, 1907.

### IMPROVEMENTS.

- |   |  |
|---|--|
| 1. Ohio River (general improvement).                | 3. Operating snag boats on Ohio River. |
| 2. Construction of Lock and Dam No. 37, Ohio River. |  |
- 

UNITED STATES ENGINEER OFFICE,  
*Cincinnati, Ohio, July 10, 1907.*

GENERAL: I have the honor to transmit herewith the annual reports of the works under my charge for the fiscal year ending June 30, 1907.

Very respectfully, your obedient servant,

WM. T. ROSSELL,  
*Lieut. Col., Corps of Engineers.*

Brig. Gen. A. MACKENZIE,  
*Chief of Engineers, U. S. A.*

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## E E I.

### IMPROVEMENT OF OHIO RIVER.

#### GENERAL IMPROVEMENT.

Operations on this improvement were in progress during the last fiscal year under the general project that has been in force for many years, as follows:

#### DIKES AND LOW DAMS IN THE OHIO RIVER—CONSTRUCTION.

*Browns Island dam (60.5 miles below Pittsburg).—*This dam, originally constructed in 1837–38 as a riprap dam to close the back channel of Browns Island, was repaired in 1881, 1882, 1883, and 1884 by

the construction of a timber crib superstructure. It is about 2,700 feet long, built up to about a 6-foot stage, and extends from the Ohio shore to head of the island.

Owing to the natural decay of the perishable materials of which the dam was constructed and the damage from ice and floods, minor repairs were rendered necessary during the seasons of 1900 and 1904. (See Report of Chief of Engineers, 1905, Appendix D D, pp. 1786-1787.)

These repairs did not suffice to arrest the destruction of the work, and examinations made during the seasons of 1905 and 1906 indicated that the work must substantially be rebuilt, either along its original lines or at a new site a few hundred feet lower downstream; the chief advantage of the latter site is that the length of the dam will be shortened from about 2,700 feet to 800 feet. Borings were made along the axis of this new proposed dam and plans and specifications prepared for its construction. It is proposed to construct the dam of piling, loose stone, and concrete, with a crown section of concrete calculated to offer little resistance to running ice, and a wide apron of large loose rock below the dam to prevent scour.

Proposals for this work were advertised for on June 18, bids to be opened July 18, 1907.

*Marietta Island dam (168.9 miles below Pittsburg).*—The original construction of a riprap dam about 900 feet long to close the back channel of Marietta Island was projected in 1868, but for various reasons no work was begun until 1871. Work under this original project was completed in 1873. A timber crib superstructure was erected on the old riprap dam in 1889, and in 1900, 1901, and 1904 minor repairs were made, mostly in the nature of loose stone filling. These repairs were undertaken only for the purpose of temporarily holding the dam until funds might become available for its thorough reconstruction. (See Report of Chief of Engineers, 1905, Appendix DD, pp. 1787-1790.) By the year 1906 the entire superstructure had suffered both from natural decay and from ice and floods to such extent that the necessity for reconstruction became pressing.

An examination made in 1906 developed the fact that a very great amount of scour had taken place immediately below the dam. For this reason a new site was examined by borings made at a point about 600 feet downstream from the old dam, and plans and specifications for a new structure at this place were prepared. It is proposed to construct the dam of piling, loose stone, and concrete in a manner generally similar to that at Browns Island, making special provision against erosion by a wide apron of large loose rock and core walls of concrete running back into the bank. The core walls are to be supplemented by riprap.

Proposals for this work were advertised for on May 29, no bids being received in response to the advertisement.

*Dike at head of Grand Chain (about 943 miles below Pittsburg).*—Under project approved February 18, 1905, the construction of a riprap dike was contemplated in the Ohio River at the head of Grand Chain, having a length of about 1,600 feet, and carried up to a height of 6 feet above low water. (See Report of Chief of Engineers, 1904, Appendix D D, pp. 2478-2482.)

The amount available when bids were opened May 31, 1905, was inadequate to carry on both this work and that at Mound City (ad-

vertised at the same time), and the dike at Grand Chain was therefore given up for the time being.

The project was revived in consequence of funds made available for general improvement of the Ohio River by the river and harbor act of March 2, 1907. Plans and specifications were prepared and proposals for the work were advertised for May 6, 1907, and bids were opened June 6.

*Mound City, Ill., dikes (about 958 miles below Pittsburg).*—Contract for the work of extending and repairing two dikes in the Ohio River near Mound City, Ill., was made with Oscar F. Barrett, June 14, 1905. Work was begun August 10, and about 8,413 cubic yards of stone placed in the dikes during the season of 1905. (See Report of Chief of Engineers, 1906, Appendix E E, p. 1542.) Owing to the prevalence of unusually high stages of the river in the vicinity of Mound City no work was done during the season of 1906. The contract is still in force and work will be resumed at the earliest practicable moment.

#### ICE PIERS.

*(Gallipolis, Ohio (267.5 miles below Pittsburg)).*—A contract for an additional section of ice pier to be built of concrete was entered into June 30, 1905, with Frank J. Du Vall and Fred C. Du Vall. This new section was to enlarge the harbor of refuge at Gallipolis, consisting of two sections of timber crib construction. (See Report of Chief of Engineers, 1905, Appendix D D, pp. 1795–1796.)

The work was begun in September, 1905, but was interrupted by successive high waters. (See Report of Chief of Engineers, 1906, Appendix E E, p. 1543.)

After much delay work was resumed August 1, 1906, and continued with interruptions from floods until November 17, 1906, when operations were suspended for the season.

During the season of 1906, the excavation involving the removal of silt, sand, and gravel was completed, and some concrete masonry laid in the foundation.

It is expected that the work will be resumed early in the working season of 1907.

During the fiscal year ending June 30, 1907, material was supplied and work completed as follows:

Timber protection.....	feet B. M.	3, 982
Pumping.....	days of 24 hours	7
Excavation.....	cubic yards	518. 84
Wrought-iron or steel in protection or forms.....	pounds	211
Concrete masonry.....	cubic yards	190. 8

#### HARBOR LINES.

The established harbor lines over which supervision is exercised by this office are those at Steubenville, Wheeling, Ironton, and Cincinnati.

The usual work was continued during the year in the investigation of encroachments and of permits requested or authorized.

Under date of April 26, 1907, I was directed to lay out tentative harbor lines at East Liverpool, Ohio, with a view toward their final adoption by the Secretary of War. A party was organized for this

work May 15, and the work incidental to the laying out of these tentative harbor lines is now in progress.

#### PERMITS.

Applications for special permits require a considerable expenditure of time and labor for the necessary examination in the field and subsequent supervision in order to secure compliance with harbor-line restrictions or, where no harbor lines have been established, with the general laws prohibiting encroachments on navigable waterways. The total number of permits granted during the year and pertaining to this district was 26, of which 2 were for gas-pipe lines, 1 for water-pipe line, 3 for overhead cables, 1 for submarine cable, 2 for inclines, 1 for track and pipe line, 4 for intakes, 1 for coal elevator, 4 for dredging, 1 for bank protection, 1 to raise sunken logs, 1 to pump sand and gravel, 1 for railroad in advance of harbor lines, 1 for poles in advance of harbor lines, and 2 for bulkheads.

#### SURVEYS.

There was no work in the field on general surveys, but special surveys incidental to examinations for permits or to the determination of encroachments have from time to time been made as was necessary.

Lithographic copies of the charts of Ohio River from Pittsburg to New Martinsville, W. Va.—132 miles—(see Report of Chief of Engineers for 1906, Appendix E E, p. 1545), have, under authority of the Chief of Engineers, been sold to those desiring them at the rate of 5 cents a sheet. Blueprints of portions of Ohio River surveys between Pittsburg, Pa., and the mouth of the Big Miami River have been under like authority sold to parties desiring them at the rate of 10 cents per linear foot.

#### DREDGING.

The project for dredging in 1906 provided for improvement of the channel at a number of places that have caused much trouble to navigation below Louisville, but owing to continued high water it was not possible to begin the work until late in July.

Both the dredges had been brought from Louisville to Cincinnati after completion of the contractor's work of enlarging and replating the hull of the *Ohio*, and the crews were employed on refitting the *Ohio* and making some repairs to the *Oswego* until July 20, when the *Oswego* was sent to Chenaults reach to open a low-water channel at that place. On arrival of the dredge at Chenaults a rise occurred that prevented work at that place, and it was therefore sent on to Fulton bar, 30 miles below, where work at a somewhat higher stage was possible, because the material composing the bar is not so hard.

Owing to the difficulty in getting satisfactory labor, refitting the *Ohio* was not completed until September 20, when the dredge was sent to join the *Oswego* at Chenaults reach.

An unusual succession of rises kept the river above a working stage for a great part of the season, so that the dredges were unable to complete any work except that at Fulton, Chenaults, and Big Blue River bar; and on November 22, when a general rise of the river made it apparent that no further work below Louisville was possible,

the fleet was ordered to the upper river, with the expectation of completing the work begun at Newberry bar in 1905. While en route to Newberry the dredge tender was disabled by an accident at Middleport, Ohio, and it was therefore decided to employ the dredges on the improvement of the Ice Harbor at that place for the short remainder of the season. After one day's work the river again rose far above the stage at which dredging is possible, and as there seemed little prospect of further favorable working conditions the fleet was sent into winter quarters at Marietta, Ohio.

During the winter and spring some necessary repairs were made to the dredge boilers, dippers, etc., and the *Oswego* was docked to replace rivets that had become loosened about the forward spud boxes. While on the docks a careful examination was made of the hull plating below the water line and a number of holes were drilled through the plates at the weakest points to determine their thickness.

The plating is iron and its original thickness was seven-sixteenths inch for the rakes and the knuckle sheets that extend from the bottom to above the water line, and three-eighths inch for the bottom plates. At the thinnest place it was found that a seven-sixteenths-inch plate had wasted to 0.22 inch and a three-eighths-inch plate to 0.20 inch, the rest averaging from 0.24 inch to 0.28 inch in thickness—these are the original plates put on when the hull was built in 1883.

The dredges were prepared to begin work by the 1st of May, 1907, but owing to an unusual succession of rises no dredging was possible till late in June.

*Hired dredging plant.*—Complaint having been made of the condition of the river channel at Short Creek, W. Va., and at Wells Run bar, Ohio, where heavy rains had caused the creeks to wash out a large amount of gravel and stone in such manner as to obstruct navigation, an emergency contract was made with the Monongahela and Western Dredging Company, of Pittsburg, Pa., for hire of a dredging plant consisting of one dipper dredge, two dump scows, and a small towboat as tender, for \$104 per day. The plant was employed from August 10 to September 1, 1906.

Under contract dated April 15, 1907, with the Monongahela and Western Dredging Company, for hire of dredging plant to be operated at Middleport, Ohio, Ice Harbor, and other points above Cincinnati, Ohio, no work has yet been done, owing to the high stage of river.

Proposals, to be opened July 3, 1907, have been invited for hire of dredging plant to be operated below Cincinnati, Ohio.

Under contract with the Howard Shipyards Company, dated November 1, 1906, work on the hull for the new hydraulic and grapple dredge is in progress, the bottom plating, longitudinal frames, side stringers, and the trusses being in place and the rake plates and deck beams fitted ready to go into place.

Acceptable proposals for constructing the 10 steel pontons for service with the hydraulic and grapple dredge have been received, and the lowest bid, that of the Springfield Boiler and Manufacturing Company, \$13,800, for the pontons delivered at Cincinnati, will be recommended for acceptance. These pontons had been advertised twice previously, but both times the bids were so high that they were rejected.

The work of the United States dredges is as follows:

*Fulton bar (717.5 miles below Pittsburg).—*Dredging at this point was for the purpose of completing work interrupted by high water in 1905.

The cuts made last year were found to be in good condition but somewhat filled with light sand. A better opening into the pool above was therefore made by extending the cuts 400 feet farther upstream, and after this was done the increased current through the cuts soon scoured out the sand deposit, making a good channel 75 feet wide and 5 feet deep at low water clear through the bar.

The excavated material was dumped on the Kentucky shore on the left, where it serves to increase the current through the new channel.

Excavation made July 31 to August 6—gravel and sand, 3,840 cubic yards.

*Chenaults reach (689 miles below Pittsburg).—*Dredging at this place was for the purpose of widening and deepening the low-water channel to complete the work interrupted by high water in 1905. The cut made in 1900 was redredged and extended 590 feet farther down and 1,080 feet farther upstream, and the cut outside of it, begun in 1905, was completed, making channel 4 feet to 5 feet deep at low water, 70 feet wide, and 3,770 feet long through the bar.

For the length of the redredged 1900 cut the material was thrown into bank on the Indiana shore. The rest of the excavated material was removed in scows, most of it being dumped on the Kentucky shore opposite, to prevent waste of water on that side of the river and to increase the flow through the new channel; but a portion of it was dumped close to the Indiana shore, at the head of the spoil bank, to prevent the current from washing the bank back into the cut.

Work was stopped by high water, which compelled the dredges to lie idle from August 16 to September 14 and from October 1 to 7.

Excavation made, August 7 to October 18—hard gravel and sand, 34,197 cubic yards.

*Big Blue River bar (657 miles below Pittsburg).—*On completion of the work at Chenaults the dredges proceeded to this place to straighten the channel by removing a portion of the bar thrown out by Big Blue River.

This high bar extended about 600 feet from shore, making navigation very difficult and dangerous owing to the sharp turns necessary in the strong current above and below it.

Dredging was begun on October 22, but owing to interruption by high water was not completed until November 13.

Six cuts were made 4 feet below zero of the gauge at foot of the locks at Louisville, straightening the channel and widening it 225 feet for a length of 1,230 feet.

The excavated material was dumped in the eddy below the bar on the Indiana shore and along the bar at foot of the island on left of the channel.

Work was stopped by high water October 25 to November 4.

Excavation made, October 22 to November 13—gravel, bowlders, etc., 23,924 cubic yards; logs removed, 2 (1.1 tons).

*Middleport, Ohio, Ice Harbor (251 miles below Pittsburg).—*While the dredges were on the way from the lower river to work at Newberry bar, the dredge tender was disabled at Middleport, Ohio, by



breaking her water-wheel shaft, obliging the fleet to stop at this point until a new tender could be procured. As the dredges were then in the Middleport harbor and the stage of river appeared likely to be favorable, work on the improvement authorized at that place was begun, a boat for temporary service as tender having been supplied by the contractors. The dredges were placed at the upper end of the bar below the ice piers and two sections of one cut were made, 35 feet wide, 6 feet below low water, and aggregating 234 feet in length. The material excavated—sand and fine gravel—was scattered in the deep water near the West Virginia shore.

Heavy rains caused a rapid rise after one day's work, and as the rise promised to be of considerable duration, so that little if any effective work was to be expected, the dredges were moved up to winter quarters at Marietta, Ohio.

Excavation made, December 3—gravel and sand, 2,070 cubic yards.

*Head of Bakers Island (48.8 miles below Pittsburg).*—The improvement desired at this place is widening and straightening the channel between the head of the island and the Ohio shore by removing the creek bar on the right and a portion of the island bar on the left of the channel. The creek bar was removed by making two cuts 6 feet below low water, covering an area 70 feet wide and 530 feet long, and one cut, 35 feet by 430 feet, 6 feet below low water, was taken from the island bar before it became necessary to move the dredges down the river.

The excavated material was dumped close to the West Virginia shore, above the old dam that closes the channel behind the island.

Excavation made—Creek bar, June 20 to 24, gravel, 3,135 cubic yards; Island bar, June 20 to 22, gravel, 2,800 cubic yards.

*Captina Island (107.3 miles below Pittsburg).*—On leaving Bakers Island the dredges were separated, the *Ohio* going to Captina and the *Oswego* to Fish Creek Island.

The improvement to be made at Captina is the removal of a point of gravel from the Ohio shore opposite the head of the island. One cut, 6 feet below low water, 35 feet wide and 720 feet long, has been made and a second cut begun.

The excavated material was dumped on the West Virginia shore above the head of the island.

Excavation made, June 26 to 29; gravel and bowlders, 4,870 cubic yards; rocks removed, 4, 3.8 tons.

*Fish Creek Island (112.8 miles below Pittsburg).*—The improvement desired at this place is to widen and straighten the channel by removing a small spur of clay and rocks extending into the channel from the Ohio shore, about 1,200 feet above the upper end of Blair Run bar; and by removing a portion of the lower end of the island bar on left of the channel just above Blair Run bar. One cut, 35 feet wide, 6 feet below low water, and 325 feet long, has been completed at the shore point, and a second cut, which will probably complete its removal, has been begun.

Excavation made, June 26 to 29; clay and rocks, 2,660 cubic yards; rock, 1, 2.2 tons; log, 1, 1.5 tons.

The work of the hired dredging plant is as follows:

*Short Creek, W. Va. (81.2 miles below Pittsburg).*—Operations were begun on August 10, but before night the river had risen so much as to stop the work. Beginning again on the 14th,

after the rise had passed, work was continued until the 25th, except on the 23d and 24th, when a rise of the river again stopped operations. Four cuts were made, widening the channel 150 feet for a length of 400 feet; the depth dredged being 1.5 feet below low water, affording safe navigation at this point. The material was dumped on the West Virginia shore, below the creek bar.

Excavation made, August 10 to 25; sand, gravel, and loose rocks, 4,160 cubic yards.

*Wells Run bar (68.2 miles below Pittsburg).*—Four cuts, 1.5 feet below low water, were made at this point, widening the channel 120 feet for a distance of 450 feet, and removing enough of the bar to afford easy passage for boats. The material excavated was dumped on the Ohio shore to right of the channel below the run bar.

Excavation made, August 27 to September 1; gravel and loose rock, 1,925 cubic yards.

*Summary of expenditures for United States dredges.*

General supplies and expenses.....	\$3, 306. 62
Towing and fuel .....	9, 348. 57
Repairs .....	3, 524. 08
Salaries .....	18, 602. 39
	<hr/> 34, 781. 66

The total excavation by the United States dredges during the fiscal year was 77,496 cubic yards, and the cost per cubic yard, including all expenditures and outstanding liabilities, was 44.8+ cents.

The year has been one of very unusual and long-continued periods of high water, which caused the loss of so much working time as to more than double the cost of the dredging, as the loss is represented not only by the number of days during which high water stopped operations entirely, because, in addition to this, there was much time when the dredges worked at a stage so high as to seriously reduce their output and increase the loss of time from accidents.

From July 20 to December 6, 1906, the time lost was—

	Days
Sundays .....	20
Holidays .....	2
Traveling .....	13½
Coaling .....	1
Accidents .....	7½
High water .....	48½
Total lost .....	<hr/> 93
Time at work .....	47

In 1907 the dredges were ready, with the expectation of beginning work May 1, but a succession of rises prevented work, even on the upper river, until June 20.

*Estimate for appropriation.*

**Low dikes and dams:**

1 stone, pile, and concrete dam at head of Buffington Island to replace existing loose stone structure.....	\$37, 500
Repairs to half-moon dam in main channel opposite Buffington Island, replacing stone.....	1, 500
Removal of Sand Creek dike entire, including dredging.....	21, 000

**Ice piers:**

Rebuilding ice piers at Middleport, Ohio, in concrete.....	35, 000
Removal of old and now dangerous ice piers at Hartford, W. Va., and Pomeroy, Ohio.....	10, 000

Supervision of harbor lines at East Liverpool, Ohio; Steubenville, Ohio; Wheeling, W. Va.; Ironton, Ohio, and Cincinnati, Ohio; also Secretary of War permits and encroachments on general river	\$6,000
Minor examinations and surveys	7,000
Dredging operations:	
4 dredges 1 year	72,000
1 towboat 1 year	8,000
2 steel or composite hull towboats	80,000
Hire of 1 dredging plant for operations between Pennsylvania State line and Wheeling, W. Va., 3 months	\$18,700
Hire of 1 dredging plant for operations between Wheeling, W. Va., and Marietta, Ohio, 3 months	18,700
	37,400
General administration, engineering, inspection, storage, etc., 1 year	30,000
Contingencies	19,600
Total	365,000

*Money statement.*

July 1, 1906, balance unexpended	\$278,673.43
Amount appropriated by river and harbor act approved March 2, 1907	470,000.00
July 3, 1906, to May 28, 1907, amount received from sale of blue-prints and charts	49.31
December 29, 1906, and June 12, 1907, amount received from sale of condemned and unserviceable property	387.46
	749,110.20
June 30, 1907, amount expended during fiscal year:	
For works of improvement	\$47,711.62
For maintenance of improvement, \$11,356.01 less \$1.10 refunded	11,354.91
	59,066.53
July 1, 1907, balance unexpended	690,043.67
July 1, 1907, outstanding liabilities	4,563.98
July 1, 1907, balance available	685,479.69
July 1, 1907, amount covered by uncompleted contracts	71,864.84
Amount (estimated) required for completion of existing project	Indefinite.
Amount that can be profitably expended in fiscal year ending June 30, 1909, for works of improvement and for maintenance of improvement, in addition to the balance unexpended July 1, 1907. Submitted in compliance with requirements of sundry civil act of June 4, 1897, and of section 7 of the river and harbor act of 1899.	
	365,000.00

## AMOUNTS AND DATES OF ALL APPROPRIATIONS FOR THIS WORK.

Act of Congress.	Appropriation.	Allotment.	Remarks.
March 3, 1827	\$30,000.00		
March 3, 1836	50,000.00		
July 2, 1836	20,000.00		
March 3, 1837	60,000.00		
July 7, 1838	50,000.00		
June 11, 1844	100,000.00		
March 3, 1847	6,479.25		
August 30, 1852	90,000.00		
June 23, 1856		\$172,000.00	Improving Mississippi, Missouri, Arkansas, and Ohio rivers.
Do		80,000.00	Snag boats and apparatus for improving Western rivers.
March 2, 1867	100,000.00		
July 25, 1868		85,000.00	Repair, preservation, extension, and completion of river and harbor works.
July 11, 1870	50,000.00		
March 3, 1871	50,000.00		

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## AMOUNTS AND DATES OF ALL APPROPRIATIONS FOR THIS WORK—cont'd.

Act of Congress.	Appropriation.	Allotment.	Remarks.
June 10, 1872.....	\$200,000.00	.....	
March 3, 1873.....	200,000.00	.....	
June 23, 1874.....	150,000.00	.....	
March 3, 1875.....	300,000.00	.....	
August 14, 1876.....	175,000.00	.....	
June 18, 1878.....	300,000.00	.....	
Do.....	50,000.00	.....	Harbor of refuge at or near Cincinnati.
March 3, 1879.....	250,000.00	.....	
June 14, 1880.....	250,000.00	.....	
March 3, 1881.....	350,000.00	.....	
March 21, 1882.....	100,000.00	.....	Continuing work on Davis Island dam.
August 2, 1882.....	350,000.00	.....	
Do.....	16,000.00	.....	Harbor of refuge near Cincinnati, Ohio.
July 5, 1884.....	600,000.00	.....	
Do.....	17,000.00	.....	Do.
August 5, 1886.....	375,000.00	.....	
August 11, 1888.....	380,000.00	.....	
September 19, 1890.....	300,000.00	.....	
January 19, 1891.....	2,123.87	.....	Relief of Stubbs & Lackey. Treasury settlement No. 2593.
July 13, 1892.....	360,000.00	.....	
August 18, 1894.....	250,000.00	.....	
June 8, 1896.....	250,000.00	.....	
July 1, 1898.....	.....	\$15,000.00	For restoring levee and banks of Ohio River at or near Shawneetown, Ill.
March 3, 1899.....	375,000.00	.....	
June 13, 1902.....	359,000.00	.....	Amount appropriated, \$400,000, \$41,000 being for falls of Ohio River at Louisville, Ky.
July 1, 1902.....	25,000.00	.....	Between Cairo and Mound City.
March 3, 1905.....	208,200.00	.....	Amount appropriated, \$300,000, \$20,800 being for dredging in pool 6, Ohio River, \$56,000 for survey of Ohio River, and \$15,000 for rock removal at head of canal at falls at Louisville, Ky.
March 2, 1907.....	450,000.00	.....	
Do.....	20,000.00	.....	For Great Miami embankment east of Lawrenceburg, Ind.
Total.....	7,268,808.12	352,000.00	

Total of appropriations, 1827-1907.....	\$7,268,808.12
Total of allotments, 1827-1898.....	352,000.00
Received from sales, etc., 1866-1907.....	9,092.49
Received from Treasury settlements, 1904, 1906..	261.70
Transferred from other appropriations, 1905.....	13,642.48
	<u>\$7,643,804.79</u>
Appropriations not drawn, 1827, 1852, and 1902..	30,023.47
Allotments not drawn, 1866, 1868.....	43,134.60
Returned by Treasury settlements.....	30.07
Amount transferred to other works.....	125,168.44
Deposited to credit of "Miscellaneous receipts" (sale of maps).....	4.25
	<u>198,360.83</u>
Total.....	<u>7,445,443.96</u>

### CONTRACTS IN FORCE.

Name of contractor: Frank J. Du Vall and Fred C. Du Vall.

Amount and character of work: \$10,239.21. Constructing concrete section of ice pier in Ohio River at Gallipolis, Ohio.

Price per unit: Timber protection, at \$74.50 per 1,000 feet B. M.; pumping, at \$12 per day of twenty-four hours; excavation, at \$1.85 per cubic yard; wrought iron or steel in protection and forms, at \$0.065 per pound; wrought-iron or steel nosings, anchors, etc., at \$0.875 per pound; concrete masonry (United States to furnish cement), at \$4.24 per cubic yard; timber forms, at \$48.50 per 1,000 feet B. M.

Date of approval: July 13, 1905.

Date of beginning: 30 days after notification of approval of contract.

Date of expiration: 100 fair working days after July 15, 1906.

Name of contractor: Oscar F. Barrett.

Amount and character of work: \$37,212.50. Extension and repair of dikes in Ohio River at Mound City, Ill.

Price per unit: Stone, 6 to 10 cubic feet each, at \$3.25 per cubic yard;  $\frac{1}{4}$  to 1 $\frac{1}{2}$  cubic feet each, at \$2.70 per cubic yard.

Date of approval: June 23, 1905.

Date of beginning: July 1, 1905.

Date of expiration: 200 fair working days after commencement.

Name of contractor: Queen City Marine Railway Company.

Amount and character of work: \$240. Rent of storage room.

Price per unit: \$20 per month.

Emergency contract dated December 29, 1905.

Date of beginning: January 1, 1906.

Date of expiration: December 31, 1906. Completed.

Name of contractor: The Queen City Marine Railway Company.

Amount and character of work: \$240. Rent of storage room.

Price per unit: \$20 per month.

Lease dated December 27, 1906.

Date of beginning: January 1, 1907.

Date of expiration: December 31, 1907.

Name of contractor: Ohio Valley Towing Company.

Amount and character of work: \$7,218.50. Hire of towboat as tender to United States dredges.

Price per unit: \$43.65 per day.

Date of approval: July 12, 1906.

Date of beginning: July 19, 1906.

Date of expiration: December 4, 1906. Completed.

Name of contractor: Ohio Valley Towing Company.

Amount and character of work: \$174.60. Hire of towboat as tender to United States dredges during remainder of working season.

Price per unit: \$43.65 per day.

Emergency contract dated December 7, 1906.

Date of beginning: December 8, 1906.

Date of expiration: December 12, 1906. Completed.

Name of contractor: Ohio Valley Towing Company.

Amount and character of work: \$198. Hire of flatboat.

Price per unit: \$3 per day.

Emergency contract dated September 13, 1906.

Date of beginning: July 19, 1906.

Date of expiration: September 22, 1906. Completed.

Name of contractor: Burnside & Burkesville Transportation Company.

Amount and character of work: \$9,000. Hire of towboat as tender to United States dredges during season of 1907.

Price per unit: \$42.35 per day.

Date of approval: May 29, 1907.

Date of beginning: June 8, 1907.

Date of expiration: About December 1, 1907.

Name of contractor: Howard Ship Yards Company.

Amount and character of work: \$19,830. Construction of steel dredge hull, with mast, boom, upper-works framing, etc.

Price per unit: \$19,830.

Date of approval: November 10, 1906.

Date of beginning: November 26, 1906.

Date of expiration: 242 days from date of beginning.

Name of contractor: Monongahela and Western Dredging Company.

Amount and character of work: \$1,508. Hire of dredging plant.

Price per unit: \$104 per day.

Emergency contract dated August 13, 1906.

Date of beginning: August 10, 1906.

Date of expiration: September 1, 1906. Completed.

Name of contractor: Monongahela and Western Dredging Company.

Amount and character of work: \$11,000. Hire of dredging plant.

Price per unit: For dredge boat with three dump scows for work above Cincinnati, Ohio: With single crew at \$80 and with double crew at \$160 per working day when at work; for same when inactive by order of the inspector, with single crew at \$40 per calendar day, increased by 50 per cent for additional crew.

For towboat as tender, for work above Cincinnati, Ohio: With single crew at \$40 and with double crew at \$80 per working day when at work; for same when inactive by order of the inspector, with single crew at \$25 per calendar day, increased by 50 per cent for additional crew.

For furnishing dredge boat with three dump scows for work below Cincinnati, Ohio: With single crew at \$88 and with double crew at \$176 per working day when at work; for same when inactive by order of the inspector, with single crew at \$40 per calendar day, increased by 50 per cent for additional crew.

For towboat as tender, for work below Cincinnati, Ohio: With single crew at \$45 and with double crew at \$90 per working day when at work; for same when inactive by order of the inspector, with single crew at \$25 per calendar day, increased by 50 per cent for additional crew.

For suitable separate room and board of inspectors, at \$15 per month for each inspector.

Date of approval: April 22, 1907.

Date of beginning: July 1, 1907.

Date of expiration: When amount available is exhausted, or at close of season.

Name of contractor: H. J. Mendel.

Amount and character of work: \$3,000. Hire of towboat and crew as additional tender to U. S. dredges.

Price per unit: \$40 per day.

Emergency contract dated June 24, 1907.

Date of beginning: June 24, 1907.

Date of expiration: 60 days, or until discharged.

#### STAGES OF OHIO RIVER IN 1906.

The following are the records of the gauges at Pittsburg, Cincinnati, and Evansville, which may be taken to represent the navigable condition of the upper, middle, and lower Ohio:

##### Gauge at Davis Island dam, near Pittsburg, Pa.

[When the dam is up, low-water readings must be obtained from the gauge at the lower end of the lock. On this gauge 3 feet 2 inches corresponds to a navigable depth of 3 feet, and 6 feet corresponds to the same depth in the river.]

Month.	Depth in channel.			Gauge readings.	
	Under 3 feet.	8 feet and over.	6 feet and over.	Highest.	Lowest.
	Days.	Days.	Days.	Feet.	Feet.
1906.					
January .....	0	31	31	17.6	5.5
February .....	0	28	8	7.0	3.9
March .....	0	31	27	16.6	6.0
April .....	0	30	30	17.8	6.8
May .....	0	31	12	7.4	3.8
June .....	0	30	6	11.9	3.8
July .....	9	22	0	4.7	2.2
August .....	3	28	12	10.5	2.6
September .....	10	20	0	8.8	2.6
October .....	0	31	12	7.6	3.2
November .....	0	30	14	12.8	3.7
December .....	0	31	31	16.8	5.0
Total .....	22	343	183		

*Cincinnati gauge.*

[The zero of this gauge is about 2 feet below low water; readings of about 4 feet correspond to about 3 feet in the channel, and those of 7 feet to about 6 feet in the channel.]

Month.	Depth in channel.			Gauge readings.	
	Under 3 feet.	3 feet and over.	6 feet and over.	Highest.	Lowest.
	<i>Days.</i>	<i>Days.</i>	<i>Days.</i>	<i>Feet.</i>	<i>Feet.</i>
January ..... 1906.	0	31	31	35.0	17.2
February .....	0	28	28	26.1	9.5
March .....	0	31	31	44.8	15.8
April .....	0	30	30	50.2	16.1
May .....	0	31	31	21.3	9.2
June .....	0	30	30	16.8	9.1
July .....	0	31	31	14.7	7.3
August .....	0	31	31	20.2	9.0
September .....	0	30	30	15.8	7.1
October .....	0	31	31	19.5	10.2
November .....	0	30	30	38.5	8.2
December .....	0	31	31	38.8	11.0
Total .....	0	365	365	.....	.....

*Evansville gauge.*

[The zero of this gauge is about at low-water line; readings of 2 feet correspond to about 3 feet in the channel, and readings of 6 feet correspond to about 6 feet in the channel.]

Month.	Depth in channel.			Gauge readings.	
	Under 3 feet.	3 feet and over.	6 feet and over.	Highest.	Lowest.
	<i>Days.</i>	<i>Days.</i>	<i>Days.</i>	<i>Feet.</i>	<i>Feet.</i>
January ..... 1906.	0	31	31	27.0	18.0
February .....	0	28	28	26.8	7.2
March .....	0	31	31	34.0	12.2
April .....	0	30	30	40.9	13.6
May .....	0	31	31	15.8	6.6
June .....	0	30	30	11.1	6.5
July .....	0	31	24	12.1	5.6
August .....	0	31	31	15.3	6.9
September .....	0	30	26	13.3	5.1
October .....	0	31	31	15.4	7.9
November .....	0	30	30	31.3	6.0
December .....	0	31	31	34.7	9.3
Total .....	0	365	354	.....	.....

## STAGES OF THE OHIO RIVER.

*Highest, lowest, and average stages of the Ohio River at Cincinnati each calendar year from 1860 to 1906, inclusive, with the highest stage during the floods of 1832 and 1847.*

Calendar year.	Highest stage.		Lowest stage.		Average for the year.
	Month.	Stage.	Month.	Stage.	
		<i>Feet.</i>		<i>Feet.</i>	<i>Feet.</i>
1832 .....	February .....	64.2	.....	.....	.....
1847 .....	December .....	63.6	.....	.....	.....
1860 .....	April .....	49.2	October .....	5.3	16.0
1861 .....	do .....	49.4	July .....	5.1	19.1
1862 .....	January .....	57.8	October .....	2.3	17.4
1863 .....	March .....	42.7	do .....	2.5	15.0
1864 .....	December .....	45.1	August .....	3.1	16.7
1865 .....	March .....	56.2	October .....	5.7	21.8
1866 .....	September .....	42.5	August .....	4.7	19.2
1867 .....	March .....	55.7	October .....	3.0	17.0
1868 .....	do .....	48.2	July .....	5.1	18.7

# 1666 REPORT OF THE CHIEF OF ENGINEERS, U. S. ARMY.

*Highest, lowest, and average stages of the Ohio River, etc.—Continued.*

Calendar year.	Highest stage.		Lowest stage.		Average for the year.
	Month.	Stage.	Month.	Stage.	
		<i>Feet.</i>		<i>Feet.</i>	<i>Feet.</i>
1869.....	April.....	48.7	August.....	5.3	19.7
1870.....	January.....	55.2	October.....	3.8	17.8
1871.....	May.....	40.5	do.....	2.7	11.8
1872.....	April.....	41.7	do.....	3.0	11.7
1873.....	December.....	44.4	do.....	3.7	18.4
1874.....	January.....	47.9	September.....	2.8	15.7
1875.....	August.....	55.8	do.....	4.2	18.7
1876.....	January.....	51.7	do.....	6.2	18.2
1877.....	do.....	58.7	October.....	3.2	15.0
1878.....	December.....	41.3	do.....	4.3	16.7
1879.....	do.....	42.7	do.....	2.5	14.6
1880.....	February.....	53.1	do.....	3.7	17.0
1881.....	do.....	50.6	September.....	1.9	16.9
1882.....	do.....	58.6	November.....	6.1	22.1
1883.....	do.....	66.3	September.....	3.6	19.5
1884.....	do.....	71.0	do.....	2.7	17.3
1885.....	January.....	46.0	do.....	2.5	15.6
1886.....	April.....	55.7	November.....	3.3	17.8
1887.....	February.....	56.2	September.....	2.7	15.1
1888.....	April.....	39.9	August.....	5.2	17.9
1889.....	February.....	38.2	September.....	5.2	18.5
1890.....	March.....	59.2	August.....	5.7	25.7
1891.....	February.....	57.3	October.....	4.4	20.5
1892.....	April.....	43.7	November.....	3.4	16.5
1893.....	February.....	54.9	August.....	3.6	17.7
1894.....	do.....	35.6	September.....	3.1	12.9
1895.....	January.....	48.4	October.....	2.3	12.2
1896.....	April.....	47.8	September.....	5.5	16.7
1897.....	February.....	61.2	October.....	3.1	16.5
1898.....	March.....	61.4	do.....	4.5	19.7
1899.....	do.....	57.4	November.....	3.4	17.1
1900.....	December.....	40.0	October.....	3.2	12.8
1901.....	April.....	59.7	November.....	4.2	17.6
1902.....	March.....	50.9	September.....	3.9	16.8
1903.....	do.....	58.1	October, Novem- ber.....	4.5	17.9
1904.....	do.....	45.9	October.....	3.3	14.6
1905.....	May.....	48.2	do.....	6.5	18.2
1906.....	April.....	50.2	September.....	7.1	17.7

\* Prepared from the stages as shown by the waterworks marks daily at 6 a. m. and 6 p. m., the previous and succeeding years having been made from one daily observation at 6 a. m.

## MONTHLY COMPARISONS OF RIVER AND RAINFALL.

*Highest, lowest, and average monthly stages of the Ohio River, and monthly and annual rainfall, at Cincinnati, in two years, ending December 31, 1905 and 1906.*

Month.	Highest.				Lowest.				Average.		Rainfall.	
	1906.		1905.		1906.		1905.		1906.	1905.	1906.	1905.
	Date.	Feet.	Date.	Feet.	Date.	Feet.	Date.	Feet.	Feet.	Feet.	Inches.	Inches.
January.....	28	35.0	18	24.0	8	17.2	4	10.7	26.7	15.0	3.25	1.80
February.....	1	26.1	28	33.7	18	9.5	21	13.0	13.9	21.8	1.68	1.76
March.....	31	44.8	13	48.1	1	15.8	22	19.7	26.3	33.3	6.03	2.46
April.....	2	50.2	1	31.8	29	16.1	25	14.8	30.3	19.7	1.20	3.14
May.....	2	21.8	16	48.2	29	9.2	20	10.7	14.2	25.2	1.10	9.62
June.....	14	16.8	28	24.2	8	9.1	22-23	9.7	12.5	16.3	5.62	2.36
July.....	25	14.7	1	21.0	17-18	7.3	31	7.1	10.1	15.8	6.60	1.04
August.....	17	20.2	22	19.0	9-10	9.0	19-20	5.4	14.3	12.9	3.78	4.66
September.....	4	15.8	19-20	14.2	22	7.1	29-30	3.7	10.1	10.2	3.90	1.54
October.....	24	19.5	26	20.0	1	10.2	6-7	3.3	13.8	10.8	1.06	4.85
November.....	23	33.5	30	20.5	16	8.2	23, 28-30	3.7	15.7	12.0	3.04	2.75
December.....	21	38.8	7	40.0	9	11.0	10	3.4	23.8	25.6	3.57	2.81
The year....	a2	50.2	b16	48.2	c22	7.1	d6-7	3.3	17.7	18.2	40.83	33.69

\*April,

\* May.

\* September.

\* October,



## LOSSES BY COLLISION WITH BRIDGES.

The following table shows the reported losses sustained by the commerce of the Ohio River by collision with the piers of bridges crossing the Ohio River to the end of the calendar year 1906:

Date, etc.	Owner.	Steamboat.	Loss.	Amount.
Stuebenville Bridge: Previously reported. Nov. 26, 1906.....	C. Jutte & Co.....	G. W. Thomas.....	Barges.....	\$123,258.00 7,500.00
Total.....				140,758.00
Henderson Bridge: Previously reported. Mar. 26, 1906.....	Monongahela River Consolidated Coal and Coke Co.	Harry Brown.....	Fuel flat..	89,660.00 1,000.00
Total.....				40,660.00

NOTE.—The above losses were reported by the owners.

## LOSSES BY COLLISION WITH OHIO RIVER BRIDGES TO DECEMBER 31, 1906.

Ohio Connecting Railway bridge.....	\$3,500.00
Beaver bridge.....	91,140.00
East Liverpool bridge.....	3,500.00
Stuebenville bridge.....	140,758.00
Wheeling and Martins Ferry bridge.....	12,150.00
Bellaire bridge.....	150,128.00
Parkersburg bridge.....	115,248.47
Point Pleasant bridge.....	9,650.00
Kenova bridge.....	77,950.00
Ashland and Ironton bridge.....	8,000.00
Newport and Cincinnati railway and highway bridge.....	48,107.00
Newport and Cincinnati highway bridge.....	750.00
Covington and Cincinnati railroad bridge.....	108,200.00
Cincinnati Southern bridge.....	14,812.00
Louisville and Jeffersonville bridge.....	7,800.00
Ohio Falls bridge.....	207,600.00
Kentucky and Indiana bridge.....	34,267.00
Henderson bridge.....	40,660.00
Cairo bridge.....	41,169.95
Total.....	1,115,388.42

## COMMERCIAL STATISTICS.

## Commerce of Ohio River in 1906.

[Compiled from reports made by owners, agents, and masters of vessels and transportation companies in compliance with act of Congress approved February 21, 1891—Public No. 92.]

Name of boat or company.	Terminal points.	Distance.	In com- mission.	Freight.	Passen- gers.
		Miles.	Months.	Tons.	
The Monongahela River Consolidated Coal and Coke Company.	Pittsburg to Cairo .....	965.0	12.0	1,204,284	.....
Do.....	Pittsburg to Louisville .....	598.0	12.0	547,790	.....
Do.....	Pittsburg to Cincinnati .....	468.0	12.0	800,000	.....
C. Jutte & Co.....	Pittsburg to Cairo .....	965.0	12.0	344,000	.....
West Kentucky Coal Co.....	do .....	965.0	10.0	145,000	.....
The A. R. Budd Coal Co.....	Pittsburg to Louisville .....	598.0	8.0	15,750	.....
Diamond Coal & Coke Co.....	Pittsburg to Cincinnati .....	468.0	10.5	25,000	.....
Clyde Coal Co.....	do .....	468.0	12.0	4,888	.....
United Coal Co.....	do .....	468.0	12.0	138,678	.....
Steamer Greenland.....	do .....	468.0	10.0	12,728	10,247

## 1668 REPORT OF THE CHIEF OF ENGINEERS, U. S. ARMY.

## Commerce of Ohio River in 1906—Continued.

Name of boat or company.	Terminal points.	Distance.	In commission.	Freight.	Passengers.
		Miles.	Months.	Tons.	
Pittsburg and Cincinnati Packet Line.	Pittsburg to Cincinnati.....	468.0	8.0	47,555	24,245
Steamer Kanawha.....	Pittsburg to Point Pleasant.....	264.5	11.0	9,500	18,850
Steamer Darling.....	do.....	264.5	5.4	10,900	.....
Steamer Ben Hur.....	Pittsburg to Parkersburg.....	184.0	9.0	2,500	5,300
Steamer Lorena.....	Pittsburg to Marietta.....	171.0	8.0	9,000	7,000
Sharpsburg Sand Co.	Pittsburg to Bellaire.....	94.0	12.0	47,172	.....
John F. Klein.....	Pittsburg to Rochester.....	25.0	5.0	.....	37,861
Steamer Short Cut.....	Pittsburg to Allegheny.....	1.0	12.0	.....	70,450
Steamer Steel Queen.....	Allegheny to Bellevue.....	4.5	12.0	6,120	149,662
Steamer Pirate.....	Rochester to Parkersburg.....	159.0	6.0	1,160	473
Steamer Princess.....	East Liverpool to Aurora.....	451.0	1.0	80	32,418
Steamer Shifter.....	East Liverpool to Parkersburg.....	140.5	9.0	.....	.....
Steamer Crusoe.....	Wellsville to Congo.....	1.0	12.0	50,000	30,000
Steamer Clerimond.....	Steubenville to Point Pleasant.....	197.0	7.0	617	.....
Armstrong Sand Co.	Wellsville to Wheeling.....	16.0	9.0	35,000	.....
Steamer West End.....	Wellsville to Brilliant.....	1.0	11.0	1,350	75,000
Sheridan-Kirk Contract Co.	Wheeling to Paducah.....	380.0	11.0	146,091	.....
Steamer H. K. Bedford.....	Wheeling to Parkersburg.....	94.0	8.0	5,975	11,972
Steamer Bessie Smith.....	do.....	94.0	9.0	10,800	7,234
Steamer Beaver.....	do.....	94.0	10.0	12,200	5,000
Steamer Jewel.....	Wheeling to Marietta.....	81.0	3.0	5,000	4,500
Steamer Ruth.....	do.....	81.0	4.5	12,500	8,800
Steamer Royal.....	Wheeling to Clarington.....	27.5	10.0	9,780	9,730
Steamer Monitor.....	West Wheeling to North Wheeling.....	8.0	9.5	71,377	.....
Steamer Buckeye.....	Wheeling to West Wheeling.....	1.0	11.0	24,000	38,554
Steamer Charon.....	Bellaire to Benwood.....	1.0	11.0	.....	292,184
Steamer Concrete.....	Glendale to Carrollton.....	442.5	1.0	500	.....
Steamer Leroy.....	Sistersville to Marietta.....	84.0	10.0	6,250	25,150
Steamer Orion.....	Sistersville to Tuels.....	1.0	12.0	182,500	36,000
Steamer Mella.....	New Matamoras to Friendly.....	1.0	12.0	528	38,000
Steamer Valley Belle.....	Marietta to Middleport.....	80.0	10.0	5,416	1,440
Steamer Sea Lion.....	Parkersburg to Louisville.....	414.0	10.0	64,800	.....
Steamer Mountain State.....	do.....	414.0	2.0	11,400	.....
Steamer Emma Marie.....	do.....	414.0	9.0	4,000	400
Steamer Dan Patch.....	do.....	414.0	5.0	1,074	465
Steamer Nellie England.....	Parkersburg to Cincinnati.....	284.5	12.0	87,000	500
Steamer Cricket.....	do.....	284.5	10.0	6,796	2,746
Steamer Katydid.....	Parkersburg to Reedville.....	20.0	12.0	980	2,100
Steamer Rayman.....	Parkersburg to Hockingport.....	14.5	11.0	700	4,500
Steamer Nina Paden.....	Parkersburg to Belpre.....	1.0	12.0	50,000	266,140
Steamer Pioneer City.....	Parkersburg to South Parkersburg.....	1.0	12.0	15,000	.....
Steamer W. O. Hughart.....	Graham to Racine.....	1.0	11.0	2,800	8,400
Steamer Klondike.....	Syracuse to Gallipolis.....	24.5	10.0	10,300	8,509
Steamer Convoy.....	Pomeroy to Louisville.....	349.0	9.0	61,950	.....
Steamer Douglass Hall.....	do.....	349.0	12.0	200,000	.....
E. B. Sutter.....	do.....	349.0	8.0	12,000	300
The E. J. Hickey Transportation Co.	Pomeroy to Cincinnati.....	219.0	11.0	202,728	.....
Cincinnati, Pomeroy and Charleston Packet Co.	do.....	219.0	12.0	121,409	50,724
Steamer Champion No. 3.....	Pomeroy to Mason City.....	1.0	12.0	.....	58,000
Steamer Little Ben.....	Middleport to Clifton.....	1.0	12.0	.....	18,702
Steamer Winifrede.....	Point Pleasant to Louisville.....	384.0	12.0	70,870	.....
The Campbell Creek Coal Co.	do.....	384.0	11.0	244,801	.....
Guyan Valley Fuel Co.	Point Pleasant to Sekitan.....	218.5	12.0	879,200	.....
Steamer Otto Marmet.....	Point Pleasant to North Bend.....	220.5	12.0	85,280	.....
Steamer Sallie Marmet.....	do.....	220.5	12.0	48,160	.....
Steamer J. B. Lewis.....	Point Pleasant to Cincinnati.....	204.0	12.0	137,800	.....
Marmet Co.	do.....	204.0	12.0	155,859	.....
Steamer Neva.....	Point Pleasant to Gallipolis.....	4.5	10.0	338	4,500
Steamer Gondola.....	do.....	4.5	11.0	8,184	3,305
Steamer Eclipse.....	do.....	4.5	5.0	50	6,000
Steamer Boone No. 4.....	Point Pleasant to opposite shore.....	1.0	3.5	500	1,463
Steamer Carrie Brown.....	Gallipolis to Huntington.....	39.0	11.5	5,984	28,952
Steamer Chevalier.....	do.....	39.0	10.5	3,000	20,000
Steamer Francis.....	Gallipolis to Poplar Grove Farm.....	1.0	12.0	12,000	25,953
Steamer Arlon.....	Proctorville to Guyandott.....	1.0	12.0	45,000	119,621
C. Crane & Co.	Guyandott to Cincinnati.....	164.0	12.0	164,400	.....
Wm. Bay.....	Proctorville to Portsmouth.....	51.5	12.0	18,035	25,970
Steamer Leni Leoti.....	Huntington to Cincinnati.....	160.0	4.0	200,000	.....
Steamer Thealka.....	Huntington to Ironton.....	19.0	6.0	2,565	425
B. F. Fleisher.....	Huntington to Rockwood.....	1.0	12.0	.....	73,000
Steamer Cando.....	Catlettsburg to Louisville.....	281.0	5.0	100,000	.....
Steamer Donca.....	Catlettsburg to Ironton.....	10.0	4.0	50,000	4,000
Steamer Bonne.....	Catlettsburg to South Point.....	1.0	12.0	1,864	19,644
Kanawha and Ohio Transfer Co.	Ashland to Ironton.....	5.0	10.5	703,146	.....

## Commerce of Ohio River in 1906—Continued.

Name of boat or company.	Terminal points.	Distance.	In commission.	Freight.	Passengers.
		Miles.	Months.	Tons.	
Steamer Wenona .....	Ashland to Coal Grove .....	1.0	12.0	.....	228, 450
Steamer Ironton .....	Ironton to Russell .....	1.0	12.0	59, 457	145, 574
Steamer Chesapeake .....	Portsmouth, Ohio, to South Portsmouth.	1.0	12.0	15, 452	182, 500
Steamer Emily .....	Portsmouth to Fullerton .....	2.0	12.0	146, 000	60, 000
Steamer W. H. Whiteman .....	Manchester to South Manchester.	1.0	11.0	6, 600	33, 000
Steamer Alert .....	Maysville to Lawrenceburg .....	83.5	6.0	821, 250	.....
Steamer Laurence .....	Maysville to Aberdeen .....	1.0	12.0	8, 500	34, 780
Steamer Florinel .....	Maysville and vicinity .....	4.0	8.0	750	1, 100
Steamer Proctor K. Smiley .....	Ripley to South Ripley .....	1.0	12.0	8, 455	43, 475
Steamer Arlona May .....	Higginsport to Barkley Landing .....	1.0	5.0	.....	1, 200
Steamer Whisper .....	Augusta to Boudes .....	1.0	11.0	.....	9, 980
Steamer Silver Star .....	New Richmond to Aurora .....	46.0	10.0	.....	445
Steamer New Richmond .....	New Richmond to South New Richmond.	1.0	12.0	13, 060	18, 829
The Coney Island Co. ....	New Richmond to Cairo .....	516.0	1.0	52	58, 399
Do. ....	Coney Island to Cincinnati .....	9.0	8.3	800	644, 497
J. R. Ware & Sons .....	do .....	9.0	12.0	90, 000	.....
B. J. Riggs .....	Bellevue to Cincinnati .....	2.0	10.0	105, 000	.....
Lee Line .....	Cincinnati to Cairo .....	497.0	8.0	22, 376	9, 219
John Barrett & Son .....	do .....	497.0	12.0	37, 750	.....
Steamer Martha H. Hennen .....	Cincinnati to Paducah .....	451.5	6.0	40, 000	.....
Steamer E. T. Slider .....	Cincinnati to Evansville .....	316.0	12.0	511, 113	.....
Steamer Blue Wing .....	Cincinnati to Louisville .....	130.0	12.0	18, 250	.....
Louisville and Cincinnati Packet Co. ....	do .....	130.0	12.0	188, 251	187, 444
People's Coal Co. ....	do .....	130.0	12.0	28, 000	.....
Steamer Geo. Matheson .....	do .....	130.0	12.0	83, 650	.....
Steamer Levi J. Workum .....	Cincinnati to Madison .....	85.0	11.0	25, 125	8, 688
Steamer J. M. Grubbs .....	Cincinnati Harbor .....	6.0	6.0	60, 000	.....
Steamer Frank Miller .....	do .....	6.0	2.0	7, 125	.....
Steamer Boone No. 5 .....	Cincinnati to Constance .....	1.0	12.0	28, 500	20, 820
Steamer Charlotte Boeckler .....	Lawrenceburg to Cairo .....	474.0	1.0	2, 796	.....
Steamer Pauline .....	Lawrenceburg to Aurora .....	4.0	12.0	8, 679	14, 118
Steamer Raymond .....	Aurora to Louisville .....	105.0	12.0	7, 800	.....
Steamer Swan .....	Aurora to Patriot .....	21.0	12.0	.....	9, 826
Steamer Fannie .....	Warsaw to Madison .....	29.0	6.0	800	.....
Steamer Lucile .....	Vevay to Bethlehem .....	37.0	12.0	4, 165	.....
Steamer Eva Everett .....	Vevay to Ghent .....	1.0	12.0	16, 000	14, 872
Louisville and Jeffersonville Ferry Co. ....	Carrollton to Leavenworth (excursions).	117.0	4.0	.....	181, 912
Steamer Falls City .....	Carrollton to Louisville .....	57.0	11.0	38, 000	4, 102
Steamer White Dove .....	Carrollton to Madison .....	14.0	9.0	1, 000	3, 025
Steamer Major Slack .....	do .....	14.0	8.0	5, 000	.....
Steamer Alys Gray .....	do .....	14.0	12.0	3, 500	2, 500
Steamer Hiawatha .....	Madison to West Point .....	71.0	12.0	.....	46, 684
Steamer Hanover .....	Madison to Bethlehem .....	14.5	12.0	1, 500	3, 887
Steamer Trimble .....	Madison to Milton .....	1.0	12.0	45, 808	20, 000
Steamer Wm. Duffy .....	Twelve Mile Island to Louisville.	12.0	12.0	225, 000	.....
Louisville and Jeffersonville Ferry Co. ....	Jeffersonville to Louisville .....	1.0	12.0	.....	343, 467
Steamer Annie L. ....	Louisville to Cairo .....	367.0	12.0	73, 000	.....
Louisville and Evansville Packet Co. ....	Louisville to Evansville .....	185.0	12.0	183, 658	27, 679
Steamer Little Willie .....	do .....	185.0	12.0	18, 381	.....
Steamer Alma .....	do .....	185.0	11.0	24, 500	.....
Steamer Nellie Willett .....	do .....	185.0	6.0	40, 000	.....
Steamer Bernice .....	Cannelton to Cairo .....	248.0	9.0	8, 794	.....
Steamer Gazelle .....	Cannelton to Owensboro .....	32.0	9.0	9, 747	5, 561
Steamer Major .....	Cannelton to Hawesville .....	1.0	12.0	1, 460	21, 600
Steamer Eclipse .....	Leavenworth to Tell City .....	62.0	9.0	9, 000	.....
Steamer Wabash .....	Owensboro to Paducah .....	171.0	8.0	12, 196	.....
Robert Hornbrook .....	Owensboro to Shawneetown .....	99.0	10.0	300, 000	20, 842
John Archbold Coal Co. ....	Newburg to Evansville .....	14.0	12.0	40, 000	.....
Steamer Newburg .....	Newburg to Hosman .....	1.0	12.0	800	10, 400
Steamer Little Clyde .....	Mouth Green River to Joppa .....	161.0	8.0	18, 000	.....
Steamer Neptune .....	Mouth Green River to Saline River.	81.5	9.0	10, 000	.....
Steamer Samuel .....	Mouth Green River to Evansville.	8.0	11.0	71, 205	.....
Steamer Edgar .....	do .....	8.0	8.0	9, 660	.....
Steamer Old Reliable .....	do .....	8.0	12.0	27, 000	.....
Green River Mining, Manufacturing and Transportation Co. ....	do .....	8.0	12.0	100, 000	.....
Steamer Alice L. Barr .....	do .....	8.0	4.0	23, 917	.....
Steamer Sunbeam .....	do .....	8.0	8.0	51, 899	.....
Charles McNutt .....	do .....	8.0	12.0	30, 000	.....
Steamer Kenols .....	do .....	8.0	1.0	200	.....

## Commerce of Ohio River in 1906—Continued.

Name of boat or company.	Terminal points.	Dis- tance.	In com- mission.	Freight.	Passen- gers.
		Miles.	Months.	Tons.	
Steamer Francis.....	Mouth Green River to Evansville.....	8.0	5.0	35,100	948
Evansville and Bowling Green Packet Co.....	do.....	8.0	12.0	31,150	24,730
Steamer John S. Hopkins...	Evansville to Paducah.....	137.0	12.0	18,275	15,347
Steamer Joe Fowler.....	do.....	137.0	12.0	17,964	16,351
Steamer New Haven.....	do.....	137.0	12.0	5,250	
Ryman Line.....	Evansville to Smithland.....	125.0	10.0	15,180	
Steamer Alfred D. Owen.....	Evansville to Shawneetown.....	65.0	12.0	7,750	
Steamer Jewel.....	Evansville to Henderson.....	11.0	12.0	35,000	40,000
Steamer Harth.....	Henderson to Paducah.....	125.0	10.0	14,000	
Steamer Henderson.....	Henderson to Indiana shore.....	1.0	10.0		5,579
Steamer Enos Taylor.....	Mount Vernon to Rose Clare.....	60.0	12.0	33,017	
Steamer George.....	Shawneetown to opposite shore.....	1.0	12.0	674	5,991
Ayer & Lord Tie Co.....	Mouth Saline River to Cairo.....	108.0	12.0	268,250	
Steamer Nellie Brown.....	De Koven Landing to Paducah.....	61.0	12.0	68,688	
Steamer Carrie Lee.....	Tolu to Paducah.....	46.0	1.0		100
Aberdeen Coal and Mining Co.....	Elizabethtown to Cairo.....	88.0	9.0	65,306	
Fairview Mining Co.....	Fairview Landing to Golconda.....	12.0	5.0	28,130	
Steamer Royal.....	Golconda to Paducah.....	30.0	11.0	4,765	25,505
Steamer Nellie.....	Smithland to Cairo.....	57.0	12.0	8,005	
Steamer Charles Turner.....	Smithland to Joppa.....	28.0	12.0	44,362	
Holcomb-Lobb Co.....	do.....	28.0	12.0	51,427	
St. Louis and Tennessee River Packet Co.....	Paducah to Cairo.....	45.0	12.0	43,607	10,490
Steamer Henrietta.....	do.....	45.0	6.0	66,000	
Steamer Dick Fowler.....	do.....	45.0	12.0	18,267	45,267
Steamer John S. Summers.....	do.....	45.0	8.0	27,600	
Steamer J. F. Buckham.....	Paducah to Joppa.....	16.0	1.0	1,332	
Steamer George Cowling.....	Paducah to Metropolis.....	9.0	12.0	7,156	48,679
Steamer Bettie Owen.....	Paducah to Brookport.....	3.0	12.0	55,000	24,009
Illinois Central Railroad Co.....	do.....	3.0	12.0	33,306	23,288
Steamer Oscar F. Keeler.....	Mound City to Cairo.....	6.0	6.0	7,000	
Total.....				11,427,784	4,349,069

## E E 2.

## CONSTRUCTION OF LOCK AND DAM NO. 37, OHIO RIVER.

The general project for this work is printed in House Document No. 336, Fifty-seventh Congress, first session, and was adopted by Congress in the river and harbor act of June 13, 1902, by appropriating \$100,000 for commencing operations and authorizing their completion under the continuing contract system, at a total cost not exceeding \$1,050,000. The river and harbor act of March 2, 1907, authorized the expenditure of \$100,000 in excess of amounts heretofore appropriated or authorized: "Provided, That the said lock and dam shall be constructed with a view to a navigable depth of nine feet."

A description of preliminary work in connection with the construction of the lock and dam is given in reports of the Chief of Engineers for 1903, Appendix F F 2, page 1645, and 1904, Appendix D D, pages 2428 to 2430, inclusive. Statements of actual construction are given in reports of the Chief of Engineers as follows: 1905, Appendix D D, pages 1816 to 1819, inclusive; 1906, Appendix E E, pages 1564 to 1567, inclusive.

The work is being carried on under contract with the Sheridan-Kirk Contract Company, dated October 27, and approved November 17, 1904.

Operations for the fiscal year ending June 30, 1907.

*River conditions.*—Work inside the three sections of the cofferdam inclosing lock and guide walls was continued from July 1 until July 23, when the river rose and flooded the dam; all work was suspended until July 30. Operations were then resumed and continued until August 14, when the cofferdam was again flooded and so remained until September 7. Work was carried on from this latter date until October 23, when a third freshet occurred interrupting all operations until November 3. Active work was then carried on until November 21, when still another freshet occurring, operations were closed for the season. The work was thus delayed by four successive floods occurring during the usual low water period, i. e., between July 1 and December 1.

Twice during the winter of 1906-7 excessive floods occurred; the first in the month of January and the second in March. These floods covered the highest crest of the river bank to a depth of about 7.3 feet, flooded the contractor's buildings and those erected for temporary use by the United States. Some small damage was done to parts of the contractor's plant, but so far as can now be determined the permanent work suffered no injury.

Rather high river stages continued until late in the month of June, 1907, when the water having subsided sufficiently, the pumps were set up and pumping begun on the 27th instant.

The specifications provide for a total suspension of operations from December 1 to June 1 in each year and on Sundays and holidays during the working season, also on days when work was stopped by ice freshets, etc.; during the past fiscal year contractors were charged with seventy-three fair working days, i. e., when conditions of river and weather permitted the prosecution of the work; and there were fifty-seven days when the work was stopped by high water or bad weather, inclusive of total suspension from December 1 to June 1.

*Cofferdams.*—The cofferdam inclosing the site for the Kentucky abutment of dam was completed during the month of July; this was subsequently pumped out and a small amount of earth excavated.

The lower wing of the central section of lock cofferdam was completed in the month of October by extension to the Ohio bank. During the progress of work about the lower gate recess and adjoining portion of lower guide wall this piece of cofferdam had been omitted to facilitate excavation and masonry construction.

The contractor has ordered material for the construction of about one-half the river cofferdam inclosing the navigable pass, and active work on this portion of the work is expected to begin with the advent of the low-water season.

*Stone filling.*—A small quantity of stone filling was placed about the pierhead of the upper guiding wall, thus completing this portion of the work.

*Ordinary excavation.*—Ordinary excavation (loose material) was carried on during the season, except when interrupted by freshets, by means of orange-peel and clam-shell buckets operated from steam derricks and by hand labor in connection with the steam cableways, derricks, and tram cars. The excavation of all loose material was completed for 555 linear feet of the land wall of lock, for 545 linear feet of the river wall, for all the lower gate-track foundation, the

lower gate recess, the masonry inclosing air pipes and electric conduit crossing the lock, the lower guide wall, and for 100 feet of the upper guide wall, the rest, excepting the portion adjoining lock wall, having been previously excavated. A considerable amount of work was also done in excavating for the upper gate-track foundations.

*Filling and grading.*—Grading on the banks was practically completed from the lower gate recess to the lower end of lower guide wall. A small amount of filling was done back of the lower gate recess, and filling back of lower guide wall was completed.

*Deposit excavation.*—The freshets which occurred during the fiscal year deposited a considerable amount of material. A portion of this was removed by the contractor and paid for under the terms of the contract. The quantities involved are noted in the summary of work done.

*Rock excavation.*—The rock excavation necessary for the construction of lower guide wall was completed; that for land wall of lock was completed from the lower recess to a point 555 feet above axis of dam; the excavation for river wall of lock was completed from lower end of pierhead to a point 543 feet above axis of dam; the excavation for lower gate recess and gate tracks was completed; also that required for the masonry inclosing air pipes and electric conduit crossing the lock.

*Concrete masonry.*—The concrete masonry of lower guide wall, both foundation and superincumbent monoliths, was entirely completed during the fiscal year. This embraced, including the wing wall, 622 linear feet of foundation and 622 linear feet of monoliths, a portion of the foundation having been laid prior to the beginning of the fiscal year. The lower gate recess was completed; also the gate-track foundation. The foundation of land wall of the lock chamber was completed from the lower gate recess wall to a point 507 linear feet above axis of dam, and monoliths have been built thereon for a distance of 305 linear feet above axis. The masonry inclosing air pipes and electric conduit crossing lock (110 feet) was completed. The foundation of river wall of lock chamber was completed from lower pierhead to a point 507 linear feet above axis of dam; the monoliths were finished for a length of 129 feet, except the raised pierhead. The foundation for upper guide wall was finished for a length of 415 linear feet from the pierhead downstream. On this foundation 400 linear feet of monoliths were built.

*Sewers, catch-basins, manholes, and roadways.*—During the fiscal year the lower end of main or outfall sewer, with its two manholes, has been completed for a length of 200 feet, inclusive of the discharge through the lower guide wall. On the main roadway leading into the lock grounds the culvert with wing walls at ends was entirely completed. The two catch-basins in connection with this part of the work were completed, except for their concrete caps and ironwork in connection with same.

*Iron and steel work.*—During the fiscal year 534,956 pounds of structural metal work have been received at the site of dam. These shipments included cast iron, wrought iron, steel, steel castings, and bronze. Ironwork was placed in the permanent work to the amount

of 236,606 pounds. This included check posts, ladders, I beams in lower gate recess, and cast-iron plates forming the cover of recess, wrought-iron covers for machinery wells, a portion of the wrought-iron curbing for machinery recesses in river wall, two discharge culverts, complete, with their chambers, valves, and shafting; tracks and pedestals for lower gate of lock, nosing plate for upper guide wall, the lower Poiree dam (below lower gate of lock), with its trestles, bearings, sockets, etc., and a variety of bolts, anchor plates, washers, etc., required to secure ironwork to the masonry. As the ironwork for the lock gates had practically been delivered early in the fall of 1906, arrangements were made for the erection of the lower gate. This work, however, had only just begun when the flood of November 21 put a stop to all work for the season. Besides the ironwork above noted, some of the 8-inch, 4-inch, and 3-inch iron pipe for the air mains and electric conduit crossing the lock was placed in position and partially embedded in concrete. The upper portions of this piping were not, however, completed.

*Cement.*—Under contract dated April 7, approved April 15, 1905, cement for the work was furnished by the Atlas Portland Cement Company. Laboratory tests of all cement used in the work were made at the site of dam. From the beginning of active operations in 1905 to the close of the fiscal year the proportion of cement used in the concrete masonry was 1.04 barrels of cement to 1 cubic yard of concrete.

*Acquisition of land.*—By authority of the Secretary of War, dated March 5, 1907, a tract of land including about 12.13 acres was purchased. This land adjoins on the east the property of the United States originally purchased for lock purposes and has a frontage on the river of over 900 feet. It was secured for the purpose of a mooring ground for tows passing through the lock.

*Summary of work done.*—Following is a summary of work done by the contractors during the fiscal year ending June 30, 1907:

Cofferdam, 20 feet wide.....	linear feet.....	467
Ordinary excavation.....	cubic yards.....	3, 945
Deposit excavation .....	do.....	1, 696
Rock excavation.....	do.....	2, 175
Ordinary filling.....	do.....	5, 904
Upper guide wall foundation:		
Stone.....	do.....	10
Stone filling.....	do.....	23
Concrete masonry.....	do.....	15, 881
Sewers.....	linear feet.....	285
Oak timber.....	feet B. M.....	1, 938
Cast iron.....	pounds.....	114, 435
Wrought iron and steel.....	do.....	121, 889
Steel castings.....	do.....	535
Ironwork delivered and paid for under paragraph 48 of specifications.....	pounds.....	534, 956
Cement delivered.....	barrels.....	18, 681½
Cement used in the work.....	do.....	16, 547½

*Money statement.*

July 1, 1906, balance unexpended-----	\$360, 885. 85
Amount appropriated by sundry civil act approved March 4, 1907----	270, 000. 00
	<hr/> 630, 885. 85
June 30, 1907, amount expended during fiscal year, for works of improvement -----	137, 537. 37
July 1, 1907, balance unexpended-----	493, 348. 48
July 1, 1907, outstanding liabilities-----	471. 97
	<hr/> 492, 876. 51
July 1, 1907, amount covered by uncompleted contracts-----	587, 639. 06
Amount (estimated) required for completion of existing project----	330, 000. 00
	<hr/> <hr/>
{ Amount that can be profitably expended in fiscal year ending June 30, 1909, for works of improvement, in addition to the balance unexpended July 1, 1907-----	330, 000. 00
{ Submitted in compliance with requirements of sundry civil act of June 4, 1897.	

## APPROPRIATIONS.

June 13, 1902-----	\$100, 000
March 3, 1903-----	400, 000
March 3, 1905-----	50, 000
March 4, 1907-----	270, 000
	<hr/>
Total-----	820, 000

## CONTRACTS IN FORCE.

Name of contractor: Sheridan-Kirk Contract Company.

Amount and character of work: \$796,152.70; construction of Lock and Dam No. 37, Ohio River.

Price per unit, original contract: Cofferdam 14 feet wide, \$19.41 per linear foot; cofferdam 18 feet wide, \$20.45 per linear foot; cofferdam 20 feet wide, \$21.68 per linear foot; temporary piling, \$15 per pile; crib timbers, \$42 per 1,000 feet B. M.; clearing land, \$150 per acre; ordinary excavation, \$0.50 per cubic yard; deposit excavation, \$0.65 per cubic yard; rock excavation, \$2 per cubic yard; channel dredging, \$0.10 per cubic yard; ordinary filling, \$0.30 per cubic yard; stone filling, \$2.50 per cubic yard; slope walls (dry stone), \$3 per cubic yard; concrete masonry, \$4.20 per cubic yard; brick paving, \$1.34 per square yard; roadways, \$1.20 per square yard; combination gutter curb, \$1 per linear foot; open gutters, \$0.70 per linear foot; catch basins, \$30 each; man-holes, \$60 each; sewers, \$1.20 per linear foot; oak timber, \$72 per 1,000 feet B. M.; pine timber, white, \$80 per 1,000 feet B. M.; cast iron, \$0.045 per pound; wrought iron and steel, \$0.06 per pound; steel castings, \$0.09 per pound; bronze, \$0.21 per pound; babbit metal, \$0.15 per pound; yellow-pine timber, \$54 per 1,000 feet B. M.; iron pipe, 3-inch diameter, \$0.24 per linear foot; iron pipe, 4-inch diameter, \$0.40 per linear foot; iron pipe, 6-inch diameter, \$0.56 per linear foot; iron pipe, 8-inch diameter, \$1.50 per linear foot; valves, 4-inch, \$4.50 each; crosses, 4-inch, \$1.75 each; tees, 4-inch, \$0.70 each; elbows, 4-inch, \$0.45 each; brass pipe, \$0.40 per pound. Supplemental contracts: Cofferdam, \$15 per linear foot; piles, \$12.50 each; stone, \$2.50 per cubic yard; wrought iron and steel, steel castings, cast iron (weights, blocks, and anchors), cast iron (air pipes, flanges, faced), and steel springs, \$0.0785 per pound; bronze (nuts, plugs, and

\* Cement to be furnished by the United States.



bushings), brass pipes (cast), copper (gaskets, for joints), babbitt metal (packing rings), \$0.60 per pound; 4-inch gate valves (iron, brass mounted), \$6.80 each; 6-inch wrought-iron pipe, \$0.95 per linear foot; 4-inch wrought-iron pipe, \$0.63 per linear foot; 4-inch elbows (screw ends), \$1.48 each; 4-inch recessed couplings, \$1.28 each; cutting and threading bolts, \$0.15 each; white oak timber (dressed and fitted), \$72 per 1,000 feet B. M.; white pine timber (dressed and fitted), \$80 per 1,000 feet B. M.

Dates of approval: Original contract, November 17, 1904; supplemental contracts, July 21 and September 28, 1905, and June 28, 1907.

Date of beginning: 30 days after notification of approval of contract.

Date of expiration: 350 fair working days after date of commencement.

Name of contractor: Atlas Portland Cement Company.

Amount and character of work: Cement in canvas sacks delivered at Fernbank, Ohio (17,000 barrels minimum; 51,000 barrels maximum).

Price per unit: \$1.46 per barrel.

Date of approval: April 15, 1905.

Date of beginning: 15 days after notification of approval of contract.

Date of expiration: Contingent on progress of work.

### E E 3.

#### OPERATING SNAG BOATS ON THE OHIO RIVER BELOW THE PENNSYLVANIA STATE LINE.

The act of Congress of September 19, 1890, as modified by that of June 3, 1896, provided for yearly appropriations of \$50,000 for this work. For phraseology of these acts and further details, see the Annual Report for 1896, Part 4, page 2093.

The work performed under this appropriation consists in the removal of snags, wrecks, rocks, and similar obstructions to navigation. During the past fiscal year the snag boat operated over the river from the Pennsylvania State line to the mouth, a distance of 927 miles.

The plant belonging to this work consists of the snag boat *E. A. Woodruff*, fitted with all necessary tools and appliances.

The snag boat was in commission at the commencement of the fiscal year and, except some short intervals required for repairs or caused by high water, etc., was engaged in her regular work, as stated in detail below, from July 1 to December 22, 1906, and from April 27 to June 30, 1907.

On July 1, 1906, the *Woodruff* was at Madison, Ind., en route upstream on her regular work; she reached Cincinnati July 3, where she was detained in repairing a broken wrecking engine and other machinery until July 30, and then continued upstream, running night and day, until reaching the mouth of Big Hocking River, 198.6 miles below Pittsburg. At this point the stage of river was found too low for travel above, and the boat was headed downstream and worked back to Cincinnati. A few days later a rise occurred in the upper river, and on August 11 the snag boat again started upstream, reaching the Pennsylvania State line on the 15th; returning thence downstream, obstructions were removed as far as Cincinnati, where she arrived August 27.

After repairing the main boilers, which required several days, the *Woodruff* left on September 4 for the lower river, removing obstructions en route, and arrived at the mouth on September 14, starting

back on the return trip the same day and carrying on regular work until reaching Cincinnati on the 28th. On October 4 the snag boat was again headed downstream for the purpose of inspecting snag-boat work and the condition of the river—removing obstructions and stopping at various points for special examination of improvements required—reaching the mouth of the river on October 11, and working back upstream to Cincinnati, where she arrived on the 25th.

On October 30 the snag boat left for work on the upper river, removing obstructions as far as Wheeling, W. Va., at which point she was joined by Lieut. Col. William T. Rossell for inspection of that portion of the river. On account of the falling river and low stage of water above, the boat was headed downstream and continued operations back to Cincinnati, arriving November 17. The river above Wheeling having risen at this time to a stage suitable for effective work, the snag boat returned direct to that section on November 20 and began operations at the Pennsylvania State line on the 28th, continuing work until return to Cincinnati on December 11, and then remained in port under orders to be ready for an emergency run in case of accident to coal fleets then descending the river. Her service was, however, not required for this purpose, and on December 22, in view of the prevailing conditions of high water, cold weather, and late season, she was placed in winter quarters near Dam 37, below Cincinnati, and, after providing for care of boat and property, all members of the crew that could be dispensed with were discharged.

During the flood of January, 1907, a small crew of steam engineers, etc., was employed as a precaution against danger to the snag boat or for her possible use as relief, all the temporary crew being furloughed as soon as the emergency had passed.

On February 23 the danger from floating ice, etc., being considered over for the winter, the *Woodruff* was taken to the foot of Lewis street, Cincinnati, and arrangements begun for the annual repairs. From this time until the latter part of April high stages of river prevailed; during March a flood height for twelve days entirely prevented some repairs and delayed others. The repairs being mostly finished on April 27, the snag boat headed upstream, removing obstructions en route, reaching the Pennsylvania State line, the upper limit of her work, on May 8, and after a few days delay by high water worked back downstream to Cincinnati. Some repairs not properly made or necessarily left unfinished prior to this trip were completed, and on May 31 the *Woodruff* resumed operations upstream, the river below Cincinnati being at too high a stage for satisfactory work on obstructions. She arrived at the upper end of her district on June 11 and remained in that vicinity, awaiting a lower stage suitable for effective work, the crew being utilized in the meantime in recanvassing the roof, repairing a bulkhead on the main deck, the port wheelhouse, etc. The river having fallen to a favorable stage, the boat resumed regular work downstream on June 21, and on June 30, the end of the fiscal year, was at Vanceburg, Ky., 91 miles above Cincinnati.

The total record of obstructions removed by the *Woodruff* during the fiscal year is as follows: One thousand and thirty-one snags, aggregating 4,754.47 tons; 4 rocks, measuring 306 cubic feet; 235

cords drift and 50 wrecks, comprising 30 coal barges, 12 coal boats, 4 barges, various, 1 flatboat, and the remains of 3 steamboats. During the year the snag boat traveled 6,316 miles.

The importance of additional plant, adapted to take full advantage of such low stages of river, can not be emphasized too strongly.

It is believed that with this equipment the work can be done more efficiently and more economically than at present.

*List of steamboat wrecks, by name, removed from the Ohio River during the fiscal year ending June 30, 1907, by the U. S. snag boat E. A. Woodruff.*

Name.	Location.	Miles below Pittsburg.
Hornet.....	Paden City, W. Va.....	132
Pauline.....	Aurora, Ind.....	494.8
Tarascon.....	Enterprise, Ind.....	755.5

*Summary of expenditures for operating snag boats on the Ohio River for the fiscal year ending June 30, 1907.*

Office expenses and superintendence.....	\$2, 100. 00
Service.....	18, 965. 64
Subsistence.....	4, 746. 34
Fuel.....	3, 015. 79
General supplies and expenses.....	3, 842. 47
Care and repair of plant.....	1, 769. 50
Total.....	34, 439. 74



## APPENDIX F F.

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### IMPROVEMENT OF MONONGAHELA RIVER, WEST VIRGINIA AND PENNSYLVANIA; OF ALLEGHENY RIVER, PENNSYLVANIA; OF OHIO RIVER, PENNSYLVANIA, AND OF HARBOR AT PITTSBURG, PENNSYLVANIA.

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REPORT OF MAJ. H. C. NEWCOMER, CORPS OF ENGINEERS, FOR THE FISCAL YEAR ENDING JUNE 30, 1907.

#### IMPROVEMENTS.

- |   |   |
|---|---|
| 1. Monongahela River, West Virginia.  | 7. Ohio River, Pennsylvania.  |
| 2. Monongahela River, Pennsylvania.   | 8. Dredging Ohio River, Pennsylvania.                               |
| 3. Operating and care of locks and dams, Monongahela River, West Virginia and Pennsylvania. | 9. Operating snag boats on the Ohio River, Pennsylvania.            |
| 4. Allegheny River, Pennsylvania, open-channel work.  | 10. Operating and care of locks and dams, Ohio River, Pennsylvania. |
| 5. Allegheny River, Pennsylvania, construction of locks and dams.                           | 11. Harbor at Pittsburg, Pennsylvania.                              |
| 6. Operating and care of locks and dams, Allegheny River, Pennsylvania.                     |   |
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UNITED STATES ENGINEER OFFICE,  
*Pittsburg, Pa., July 9, 1907.*

GENERAL: I have the honor to forward herewith annual reports of works under my charge for the year ending June 30, 1907.

Very respectfully, your obedient servant,

H. C. NEWCOMER,  
*Major, Corps of Engineers.*

Brig. Gen. A. MACKENZIE,  
*Chief of Engineers, U. S. A.*

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#### F F 1.

#### IMPROVEMENT OF MONONGAHELA RIVER, WEST VIRGINIA.

This work was in local charge of Mr. J. L. Callard, assistant engineer, during the fiscal year.

*Lock and dam No. 10.*—The height of the lower guide crib, which is 156 feet long, was increased 6 feet, and at its lower end a return crib was built to connect with the bank. The space back of the crib was filled within 2 feet of grade with stones and coarse gravel, and the surface of two-thirds of the space was covered with stone paving, and the remainder of the surface with a 2-foot layer of riprap.

*Locks and Dams Nos. 11, 13, and 14.*—At each of these locks the height of the lower guide wall, which is 50 feet long, was increased 6 feet, and its length was increased 100 feet by the construction of a crib, having at its lower end a return crib to connect with the bank. The space back of both wall and crib was filled within 2 feet of grade with stones and coarse gravel. The surface of the space back of the wall was protected with stone paving and that back of the crib with a 2-foot layer of riprap.

In connection with the above-mentioned work there were used, approximately, 107,400 feet B. M. of oak timber and 3,048 cubic yards of stone.

*Money statement.*

July 1, 1906, balance unexpended.....	\$99,777.30
Amount received from sale of condemned property.....	21.64
	<hr/>
June 30, 1907, amount expended during fiscal year, for works of improvement.....	99,798.94
	<hr/>
July 1, 1907, balance unexpended.....	30,994.89
July 1, 1907, outstanding liabilities.....	68,804.05
	<hr/>
July 1, 1907, balance available.....	432.05
	<hr/>
July 1, 1907, balance available.....	68,372.00

APPROPRIATIONS.

June 10, 1872, improving Monongahela River between Morgantown and New Geneva.....	\$25,000.00
March 3, 1873, improving upper Monongahela River near Morgantown, W. Va.....	66,000.00
June 23, 1874, improving upper Monongahela River near Morgantown, W. Va.....	25,000.00
March 3, 1875, improving upper Monongahela River near Morgantown, W. Va.....	22,000.00
June 18, 1878, improving Monongahela River, West Virginia and Pennsylvania.....	25,000.00
March 3, 1879, improving Monongahela River, West Virginia and Pennsylvania.....	24,000.00
June 14, 1880, improving Monongahela River, West Virginia.....	25,000.00
March 3, 1881, improving Monongahela River, Pennsylvania and West Virginia.....	25,000.00
August 2, 1882, improving Monongahela River, West Virginia.....	25,000.00
July 5, 1884, improving Monongahela River, West Virginia.....	45,000.00
August 5, 1886, improving Monongahela River, Pennsylvania and West Virginia.....	90,900.00
August 11, 1888, improving Monongahela River, West Virginia.....	35,000.00
September 25, 1889 (allotment).....	4,000.00
July 13, 1892, improving Monongahela River, West Virginia.....	25,000.00
August 18, 1894, improving Monongahela River, West Virginia and Pennsylvania.....	20,000.00
June 3, 1896, improving upper Monongahela River, West Virginia.....	30,000.00
June 4, 1897, improving upper Monongahela River, West Virginia.....	350,000.00
July 1, 1898, improving upper Monongahela River, West Virginia.....	400,000.00
June 28, 1902, improving Monongahela River, West Virginia.....	350,000.00
April 28, 1904, improving Monongahela River, West Virginia.....	100,000.00
	<hr/>
Total.....	1,711,900.00
Received on bond of failing contractor.....	107,463.86
Receipts from sales.....	21.64
	<hr/>
	1,819,385.50

## COMMERCIAL STATISTICS.

*Traffic through United States Locks Nos. 9-15, inclusive, for the year 1907, as measured by the commerce through Lock No. 9.*

Freight .....	tons ..	36,972
Passengers .....	number ..	12,516

## F F 2.

## IMPROVEMENT OF MONONGAHELA RIVER, PENNSYLVANIA.

*Rebuilding Lock and Dam No. 2.*—This work was in local charge of Mr. T. P. Roberts, assistant engineer, from the beginning of the fiscal year until the completion of the lock and dam.

During the month of July, 1906, 10 drums, forming the adjustable top of dam, 400 feet long from lock wall to pier in mid river, were completed and placed in operation. By September 11 the two gaps in the remaining 400 feet of the dam were filled with concrete (about 260 cubic yards) and 10 drums put in place, and the entire line of dam, with 20 drums forming its adjustable top, was completed, proving of decided benefit to navigation by raising the pool an extra 3 feet when desired.

The actual quantities of materials placed under contract and the cost thereof in unit quantities are given below.

*Furnishing and delivering a steel movable top for Dam No. 2.*

[Contractor : Penn Bridge Company.]

Item.	Designation.	Quantities.	Price per pound.
Malleable iron .....	Pounds .....	3,600	Cents. 14.00
Steel .....	do .....	260,700	4.78

*Rebuilding Lock and Dam No. 3.*—This work was in local charge of Capt. F. C. Boggs, Corps of Engineers, from July 1, 1906, to January 14, 1907, and of Capt. E. M. Adams, Corps of Engineers, from February 11, 1907, to June 30, 1907.

During the year The Dravo Contracting Company, of Pittsburg, Pa., contractor for building the lock, guide, and guard walls, completed its work and removed the cofferdam. The same company, under an emergency contract, built the foundation for power house, the power house being also completed under contract with Joseph Moscarelli, of Beaver Falls, Pa. The Hall Steam Pump Company, of Pittsburg, Pa., furnished and installed compressed air machinery for operating the lock, under contract. Two lock houses were completed under contract with the B. J. Jacobs Lumber Company, of West Elizabeth, Pa., with the aid of labor and material furnished by the United States on account of delay and some poor work on the part of the contractor. Air and water lines were installed on the locks.

° 2,000 pounds..

The United States, by hired labor, erected four pairs of lock gates, and also installed the engines for operating valves and lock gates.

The valves and valve-operating machinery were installed in the abutment, for use in connection with maneuvering of movable top of dam. The pier about midway in dam was completed, and foundation of eastern section of dam was 75 per cent completed.

Dredging was carried on above and below the lock, sill water to both entrances being thereby secured.

The quantities of materials placed or work done by hired labor were as follows: Material dredged, 46,000 cubic yards; rock removed, 2,600 cubic yards; riprap placed, 1,020 cubic yards; round piles driven in dam, 570; Wakefield sheet piling driven in dam, 210; crib built and sunk in dam, 376 by 11 by 18 feet; cofferdam built, 700 feet; concrete placed in the dam, 260 cubic yards; concrete placed in the pier, 490 cubic yards.

The river chamber of the lock was opened to navigation on May 20, 1907.

The actual quantities of materials placed under contract and the cost thereof in unit quantities are given below:

*Building a lock with two chambers, two guide walls, and a guard wall.*

[Contractor: The Dravo Contracting Company.]

Item.	Designation.	Quantities.	Price per cubic yard.
Earth excavation .....	Cubic yards .....	12,397	\$0.50
Rock excavation .....	.....do .....	6,555	2.00
Back fill .....	.....do .....	3,639	.30
Concrete .....	.....do .....	29,267	5.25

*Constructing concrete foundation and floor for power house.*

[Contractor: The Dravo Contracting Company.]

Item.	Designation.	Quantities.	Price per cubic yard.
Excavation .....	Cubic yards .....	212	\$0.75
Concrete .....	.....do .....	764	7.25

*Building and delivering five pairs of lock gates and anchorages.*

[Contractor: N. D. Yant & Co.]

Item.	Designation.	Quantities.	Price per pound.
			Cents.
Medium steel .....	Pounds .....	499,882	3½
Iron and steel castings .....	.....do .....	8,600	4½
Bronze .....	.....do .....	120	30
Anchorage .....	.....do .....	25,850	5½

*Rebuilding Lock and Dam No. 5.*—On March 2, 1907, Congress appropriated \$256,042 for the beginning of work on the construction of this lock and dam, and authorized additional work to the amount



of \$500,000. Plans for the abutment and dam, to be built by hired labor, have been approved. Plans and specifications for the double lock, guard and guide walls, to be built under contract, have been submitted to the Chief of Engineers.

### *Money statement.*

[For detailed money statements see pages 545 and 546.]

July 1, 1906, balance unexpended.....	\$484, 097. 54
Amount appropriated by river and harbor act approved March 2, 1907.....	256, 042. 00
	<hr/> 740, 139. 54
June 30, 1907, amount expended during fiscal year, for works of improvement.....	371, 479. 44
July 1, 1907, balance unexpended.....	368, 660. 10
July 1, 1907, outstanding liabilities.....	15, 694. 04
July 1, 1907, balance available.....	<hr/> 352, 966. 06
July 1, 1907, amount covered by uncompleted contracts.....	20, 216. 51
Amount (estimated) required for completion of existing project.....	<hr/> 500, 000. 00
<hr/>	
{ Amount that can be profitably expended in fiscal year ending June 30, 1909, for works of improvement (new Dam 5), in addition to the balance unexpended July 1, 1907.....	400, 000. 00
{ Submitted in compliance with requirements of sundry civil act of June 4, 1897.	

### APPROPRIATIONS.

August 11, 1888, costs of condemnation, Lock and Dam No. 7, Monongahela River, Pennsylvania.....	<sup>a</sup> \$5, 000. 00
September 19, 1890, costs of condemnation, Lock and Dam No. 6, Monongahela River, Pennsylvania.....	<sup>b</sup> 5, 000. 00
August 11, 1888, purchase of upper Lock and Dam No. 7, Monongahela River.....	<sup>c</sup> 161, 733. 13
September 19, 1890, purchase of upper Lock and Dam No. 6, Monongahela River.....	<sup>d</sup> 162, 000. 00
June 3, 1896, costs of condemnation, property of Monongahela Navigation Company.....	<sup>e</sup> 5, 000. 00
June 3, 1896, award for property of Monongahela Navigation Company.....	3, 761, 615. 46
March 3, 1899, improving Locks Nos. 3 and 6, and for floating plant.....	50, 000. 00
June 6, 1900, completing improvement at Locks Nos. 3 and 6, and for floating plant.....	135, 556. 00
June 13, 1902, rebuilding Lock and Dam No. 2.....	200, 000. 00
March 3, 1903, rebuilding Lock and Dam No. 2.....	455, 961. 00
March 3, 1905, certain improvements at Locks and Dams Nos. 5 and 6.....	7, 850. 00
March 3, 1905, rebuilding Lock and Dam No. 3.....	200, 000. 00
June 30, 1906, rebuilding Lock and Dam No. 3.....	389, 196. 00
March 2, 1907, rebuilding Lock and Dam No. 5.....	256, 042. 00
Receipts from other sources.....	257. 32
Total.....	<hr/> 5, 795, 210. 91
Amount carried to surplus fund.....	331, 274. 71
Total.....	<hr/> 5, 463, 936. 20

<sup>a</sup> Partly applied; \$98.64 to surplus fund.

<sup>b</sup> To surplus fund.

<sup>c</sup> Partly applied; \$161,333.13 to surplus fund.

<sup>d</sup> Partly applied; \$2,842.94 to surplus fund.

CONTRACTS IN FORCE.

**BUILDING A LOCK WITH TWO CHAMBERS, TWO GUIDE WALLS, AND A GUARD WALL BELOW TURTLE CREEK, OPPOSITE THE EDGAR THOMPSON FURNACES, MONONGAHELA RIVER.**

Contractor: The Dravo Contracting Company, Pittsburg, Pa.

Rates: Earth excavation, 60 cents per cubic yard; hardpan excavation, 75 cents per cubic yard; rock excavation, \$1 per cubic yard; piles, \$6 each; piles sheet, \$55 per M feet B. M.; caps, flooring, and wales (oak), \$54 per M feet B. M.; grillage (hemlock), \$41.50 per M feet B. M.; crib timber (hemlock), \$43 per M feet B. M.; stone ballast, \$2.50 per cubic yard; concrete (lock, guide, and guard walls), \$5.50 per cubic yard; concrete (floor of lock), \$5.50 per cubic yard; I-beams (steel), 4 cents per pound; iron for bolts, shoes, etc., 4 cents per pound.

Supplemental contract providing for change in method of payment.

Dates of approval: Original contract, May 16, 1904; supplemental contract, February 23, 1906.

Date of beginning work: June 7, 1904.

Date of expiration: June 30, 1905 (extended for a reasonable period).

**FURNISHING AND DELIVERING AT NEW LOCK NO. 2, MONONGAHELA RIVER, PENNSYLVANIA, A STEEL MOVABLE TOP FOR DAM NO. 2, MONONGAHELA RIVER.**

Contractor: Penn Bridge Company, Beaver Falls, Pa.

Rates: Malleable iron, 14 cents per pound; steel, 4.78 cents per pound.

Date of approval: July 13, 1905.

Date of beginning work: July 13, 1905.

Date of expiration: October 15, 1905.

**FURNISHING AND DELIVERING ONE PAIR OF STEEL LOCK GATES AND ANCHORAGES AT LOCK NO. 2, MONONGAHELA RIVER.**

Contractor: N. D. Yant & Company, Allegheny, Pa.

Rates: Structural steel, 3½ cents per pound; iron and steel castings, 12 cents per pound; bronze, 55 cents per pound; anchorages, 10 cents per pound.

Date of approval:<sup>a</sup>

Date of beginning work: May 21, 1906.

Date of expiration: August 24, 1906 (extended for a reasonable period).

**BUILDING A LOCK WITH TWO CHAMBERS, TWO GUIDE WALLS, AND A GUARD WALL, ON THE MONONGAHELA RIVER, NEAR ELIZABETH, PA.**

Contractor: The Dravo Contracting Company, Pittsburg, Pa.

Rates: Earth excavation, 50 cents per cubic yard; rock excavation, \$2 per cubic yard; back fill, 30 cents per cubic yard; concrete, \$5.25 per cubic yard; reinforced concrete, \$7 per cubic yard.

Date of approval: June 28, 1905.

Date of beginning work: July 20, 1905.

Date of expiration: August 1, 1906 (extended for a reasonable period).

**FURNISHING AND DELIVERING FIVE PAIRS OF LOCK GATES AND ANCHORAGES AT NEW LOCK NO. 3, MONONGAHELA RIVER.**

Contractor: N. D. Yant & Company, Allegheny, Pa.

Rates: Original contract. Medium steel, 3½ cents per pound; iron and steel castings, 4½ cents per pound; bronze, 30 cents per pound; anchorages, 5½ cents per pound.

Rate: Supplemental contract. For making change in construction of gates, \$65.82.

Dates of approval: Original contract, April 30, 1906; supplemental contract, December 19, 1906.

Date of beginning work: May 12, 1906.

Date of expiration: September 15, 1906 (extended for a reasonable period).

**FURNISHING AND DELIVERING 23 FLATS OF SAND AND 70 FLATS OF GRAVEL AT NEW LOCK NO. 3, MONONGAHELA RIVER.**

Contractor: Rodgers Sand Company, Pittsburg, Pa.  
Rates: Sand, 2 cents per bushel; gravel, 1½ cents per bushel.  
Date of approval: <sup>a</sup>  
Date of beginning work: } As required by due notice.  
Date of expiration: }

**FURNISHING AND DELIVERING 520 PILES ON BOUNDHOUSE SIDING, MONONGAHELA DIVISION, PENNSYLVANIA RAILROAD, WEST ELIZABETH, PA. (NEW LOCK NO. 3, MONONGAHELA RIVER).**

Contractor: Runkle & Wright, Mercer, Pa.  
Rate: 12½ cents per linear foot.  
Date of approval: <sup>a</sup>  
Date of beginning work: } On or before July 7, 1906.  
Date of expiration: }

**FURNISHING AND DELIVERING 500 PIECES OF OAK AT BOUNDHOUSE SIDING, MONONGAHELA DIVISION, PENNSYLVANIA RAILROAD, WEST ELIZABETH, PA. (NEW LOCK NO. 3, MONONGAHELA RIVER).**

Contractor: The McClure Timber Company, Pittsburg, Pa.  
Rate: \$30 per M feet B. M.  
Date of approval: <sup>a</sup>  
Date of beginning work: } On or before June 30, 1906 (extended for a reason-  
Date of expiration: } able period).

**FURNISHING AND DELIVERING TIMBER ON BOUNDHOUSE SIDING, MONONGAHELA DIVISION, PENNSYLVANIA RAILROAD, WEST ELIZABETH, PA. (NEW LOCK NO. 3, MONONGAHELA RIVER).**

Contractors: T. D. Collins, Nebraska, Pa.; G. F. Watson, Tionesta, Pa., and R. T. Buzard, Sheffield Pa.  
Rates: Beech timber 18 and 20 feet long, \$19.50 per M feet B. M.; beech timber 30 feet long, \$25.50 per M feet B. M.  
Date of approval: <sup>a</sup>  
Date of beginning work: } On or before June 30, 1906.  
Date of expiration: }

**FURNISHING AND DELIVERING 3,000 BARRELS OF CEMENT (4 SACKS TO CONSTITUTE A BARREL) ON BOUNDHOUSE SIDING, MONONGAHELA DIVISION, PENNSYLVANIA RAILROAD, WEST ELIZABETH, PA. (NEW LOCK NO. 3, MONONGAHELA RIVER).**

Contractor: D. J. Kennedy Company, Pittsburg, Pa.  
Rate: 47½ cents per sack of 95 pounds, less 7½ cents each for return of empty sacks.  
Date of approval: <sup>a</sup>  
Date of beginning work: July 1, 1906.  
Date of expiration: December 1, 1906 (extended for a reasonable period).

**FURNISHING AND DELIVERING TWO RIGHT-HAND AIR ENGINES ON DEAYO SIDING, PITTSBURGH AND LAKE ERIE RAILROAD, ELIZABETH, PA. (NEW LOCK NO. 3, MONONGAHELA RIVER).**

Contractor: J. & J. B. Milholland Company, Pittsburg, Pa.  
Rate: \$2,020 for the two engines.  
Date of approval: <sup>a</sup>  
Date of beginning work: June 17, 1906.  
Date of expiration: September 11, 1906 (extended for a reasonable period).

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<sup>a</sup> Emergency.

1686 REPORT OF THE CHIEF OF ENGINEERS, U. S. ARMY.

FURNISHING AND DELIVERING TWO LEFT-HAND AIR ENGINES ON DRAVO SIDING, PITTSBURGH AND LAKE ERIE RAILROAD, ELIZABETH, PA. (NEW LOCK NO. 3, MONONGAHELA RIVER).

Contractor: J. & J. B. Millholland Company, Pittsburg, Pa.

Rate: \$2,020 for the two engines.

Date of approval.<sup>a</sup>

Date of beginning work: On or before September 3, 1906.

Date of expiration: On or before September 3, 1906 (extended for a reasonable period).

FURNISHING AND DELIVERING EIGHT CYLINDRICAL VALVES ON DRAVO SIDING, PITTSBURGH AND LAKE ERIE RAILROAD, ELIZABETH, PA. (NEW LOCK NO. 3, MONONGAHELA RIVER).

Contractor: Balr & Gazzam Manufacturing Company, Pittsburg, Pa.

Rate: \$4,032.05 for the eight valves.

Date of approval.<sup>a</sup>

Date of beginning work: July 22, 1906.

Date of expiration: September 15, 1906 (extended for a reasonable period).

BUILDING TWO LOCK-KEEPERS' HOUSES AT NEW LOCK NO. 3, MONONGAHELA RIVER.

Contractor: B. F. Jacobs Lumber Company (Incorporated), West Elizabeth, Pa.

Rate: \$6,700 for each house.

Date of Approval: August 8, 1906.

Date of beginning work: September 7, 1906.

Date of expiration: January 7, 1907 (extended for a reasonable period).

FURNISHING AND INSTALLING COMPRESSED-AIR MACHINERY FOR NEW LOCK NO. 3, MONONGAHELA RIVER.

Contractor: Hall Steam Pump Company, Pittsburg, Pa.

Rate, original contract: \$11,349.

Rate, supplemental contract: For making change in form and dimension of flues, \$136.

Dates of approval: Original contract, August 16, 1906; supplemental contract, April 27, 1907.

Date of beginning work: August 20, 1906.

Date of expiration: February 2, 1907 (extended for a reasonable period).

CONSTRUCTING CONCRETE FOUNDATION AND FLOOR FOR POWER HOUSE AT NEW LOCK NO. 3, MONONGAHELA RIVER.

Contractor: The Dravo Contracting Company, Pittsburg, Pa.

Rates, original contract: Excavation, 75 cents per cubic yard; concrete, \$7.25 per cubic yard.

Rates, supplemental contract: For increased quantities of excavation and concrete; unit prices same as specified in original contract.

Dates of approval: Original contract<sup>a</sup>; supplemental contract, November 24, 1906.

Date of beginning work: August 27, 1906.

Date of expiration: August 31, 1906.

BUILDING A POWER HOUSE AT NEW LOCK NO. 3, MONONGAHELA RIVER.

Contractor: Joseph Moscarelli, Beaver Falls, Pa.

Rate, original contract: \$7,657.

Rate, supplemental contract: For constructing bay window, \$200.

Dates of approval: Original contract, September 19, 1906; supplemental contract, November 1, 1906.

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<sup>a</sup> Emergency.

FURNISHING AND DELIVERING EIGHT SETS OF MACHINERY FOR OPERATING GATES, ETC., ON DRavo SIDING, PITTSBURGH AND LAKE ERIE RAILROAD, ELIZABETH, PA. (NEW LOCK NO. 3, MONONGAHELA RIVER).

Contractor: J. & J. B. Milholland Company, Pittsburg, Pa.

Rate: \$5,400 for the eight sets of machinery.

Date of approval:<sup>a</sup>

Date of beginning work: September 19, 1906.

Date of expiration: October 20, 1906 (extended for a reasonable period).

BUILDING AND DELIVERING A STEEL MOVABLE TOP FOR NEW DAM NO. 3, MONONGAHELA RIVER.

Contractor: Penn Bridge Company, Beaver Falls, Pa.

Rates: Structural steel, including all bolts and washers, 5.35 cents per pound; bronze springs and bolts, 80 cents per pound; rubber packing, 65 cents per pound; malleable iron hinges, 13.5 cents per pound.

Date of approval: May 14, 1907.

Date of beginning work: June 1, 1907.

Date of expiration: September 28, 1907.

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### F F 3.

OPERATING AND CARE OF LOCKS AND DAMS, MONONGAHELA RIVER, WEST VIRGINIA AND PENNSYLVANIA.

The operating and care of Locks and Dams Nos. 1 to 6, inclusive, were in charge of Mr. T. P. Roberts, assistant engineer, and Locks and Dams Nos. 7 to 15, inclusive, in charge of Mr. J. L. Callard, assistant engineer, during the fiscal year.

Aside from routine operations and minor repairs, the principal items of work at the various locks and dams were as follows:

*Lock and Dam No. 1.*—In July new steel gates were substituted for the old, decayed wooden gates at the upper end of the large lock. The old gates had been in service sixteen years and had been operated approximately 1,000 times per month during that period. The downstream end of the lower guide crib, for a length of about 150 feet, was extensively repaired above the water line, the amount of timber used being 21,000 feet B. M. About June 1 work was started upon repairs to lock walls and gates of the outer lock and lower gates of large lock, involving the quoins, valves in gates, acorn plates, repairs to gate arms, sheeting, etc. During the March flood the lock walls were submerged to the depth of 16.4 feet, doing some damage to the office building, fences, etc.

*Lock and Dam No. 2.*—Owing to the need of dredge boats at new work in progress elsewhere on new locks and dams, work upon the removal of the old abandoned Lock and Dam No. 2 was frequently interrupted. By the end of June, however, about 430 feet of the dam and the outer lock wall, which latter required blasting, were removed to a depth of about 12 feet below pool level. About 500 feet of the dam still remains and will be removed in whole or in great part during the coming season. The March flood carried away a frame warehouse 65 feet by 30 feet, which had been moved on boats from the old to the new lock. Its foundations were not completed

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<sup>a</sup> Emergency.

when the flood came; fortunately it contained but little property. On account of continuous high water during the winter and to date, there has been no necessity for raising the drum weirs on the dam. These drums, when up, add 3 feet to the navigable depth in pool No. 2.

*Lock and Dam No. 3.*—In May it was found necessary to overhaul a number of the lock gates and do considerable repair work to masonry of the middle wall to keep the locks in efficient service for the few months remaining until the new lock and dam, 1 mile below, are completed. It was also found necessary after the spring floods to dredge about 10,000 cubic yards of deposits from the lower approach to the old locks.

*Lock and Dam No. 4.*—The upper end of the large lock was pumped out September 22, to effect repairs to the horizontal butterfly filling valves in the floor above the upper gates. These valves had been in use for twenty-one years without requiring attention. Repairs were completed October 3.

*Lock and Dam No. 5.*—The lock was closed for repairs for several weeks during August and September. The breast wall was rebuilt in part, six new horizontal filling valves put in place, miter sills repaired, and chamber floor replanked throughout. The protection crib outside of lock wall was repaired by the removal of decayed timbers above lower pool level.

*Lock and Dam No. 6.*—The timber abutment of the dam was repaired with new timber and plank sheeting. A diver was employed to effect repairs to filling valves.

*Lock and Dam No. 7.*—A bathroom was built in the basement of dwelling No. 1 and a sewer laid from the bathroom to the river. Both dwellings and the office room were equipped for heating and lighting with natural gas. Minor repairs were made to the buildings. A slip of the right bank of the river just above the lock was removed by the dredge *Eastern*. Oak guard rails were placed along the front edges of the tops of both lock walls. The lower gates were thrown and wickets in same repaired. It has been found that medium hard bronze collars or rings on wicket bearings in use from five to eight years under water, working against steel bearings, show but slight indication of wear, whereas the steel in some cases has been greatly worn by the mud and sand carried in suspension.

*Lock and Dam No. 8.*—Concrete foundations were built for two privies and the privies moved thereon. Tile drains were laid to carry the waste water from both dwellings to the privies and a sewer line was laid from the privies to the river. Both dwellings and the office room were equipped for heating and lighting with natural gas. Bars formed at the entrances of the lock were removed by the dredge *Eastern*. During a freshet in December, about 80 feet of the apron of the dam next the lock wall, owing probably to vibrations of the timbers, loosened its bolts and floated up, and as it was bound in with timbers of the dam proper, nearly the whole structure for the length mentioned was carried away by the powerful current setting through the gap. Fortunately the foundation was rock, more or less solid. A cofferdam above the gap was nearly completed when, on January 17, it was carried away by a freshet. Dimension stone was then thrown above the gap from the lock until enough water was shut off to permit the sinking of cribs and the rebuilding of the dam in a very substan-

tial manner, the completion of which, owing to frequent rises, was delayed until about March 1.

*Lock and Dam No. 9.*—A bar formed at the lower entrance to the lock was removed by U. S. dredge *No. 1*.

*Lock and Dam No. 10.*—The stone paving, damaged by floods, was repaired, and the joints of the stone paving on the lock terreplein were pointed with cement mortar. The rooms of both dwellings were papered, except the kitchens, which were painted. Steel cover plates were placed over the gate anchorages.

*Lock and Dam No. 11.*—The group of buildings was inclosed with a wire fence. Joints of the stone paving on the lock terreplein were pointed with cement mortar. The left bank of the river was covered with riprap from the end of the upper guide wall to the upstream boundary of the lock grounds, and the riprap protection to the right bank below the dam was repaired. The rooms of both dwellings were papered, except the kitchens, which were painted. Steel cover plates were placed over the gate anchorages and over the right valve maneuvering gear.

*Lock and Dam No. 12.*—The joints of the stone paving on the lock terreplein were pointed with cement mortar. A concrete gutter and a tile drain were laid at both ends of the lock terreplein to catch and carry off the surface water. The damage done to the river bank below the abutment end of the dam by the floods was repaired. Steel cover plates were placed over the gate anchorages and over the right valve maneuvering gear. The rooms of both dwellings were papered, except the kitchens, which were painted.

*Lock and Dam No. 13.*—The joints of the stone paving on the lock terreplein were pointed with cement mortar. The rooms of the two dwellings were papered, except the kitchens, which were painted. Steel cover plates were placed over the gate anchorages and over the right valve maneuvering gear.

*Lock and Dam No. 14.*—A concrete apron 2 feet thick and having an average width of 30 feet, reenforced in both directions with old chains, was laid over the stone paving covering the bank next below the core wall at the abutment end of the dam. A bulkhead of clayey material, with a row of 2-inch plank along its center line, was built across a low place back of the railroad track, and about on a line with the core walls. A section of the sunken stone paving on the lock terreplein was relaid. The damage done by the floods to the riprap protection to the right bank of the river below the dam was repaired. The joints of the stone paving on the lock terreplein were pointed with cement mortar. The rooms of both dwellings were papered, except the kitchens, which were painted. Steel cover plates were placed over the gate anchorages and over the right valve maneuvering gear.

*Lock and Dam No. 15.*—The joints of the stone paving of the highway across the lock terreplein were filled with clay puddle. The brick paving on the lock terreplein and the stone paving back of the lower guide wall were repaired. A concrete platform was laid below the lower wing wall. Repairs were made to one of the filling valves. The rooms of both dwellings were papered, except the kitchens, which were painted. Steel cover plates were placed over the gate anchorages.

*Boat yard and shop, Lock No. 4.*—A number of wickets for the movable dams on the Ohio River were made at the yard. The construction of a pair of new dredge scows was in progress at the end of the year. The sawmill furnished most of the material needed in repairs to dams, steamers, flatboats, etc. The machine shop was kept busy in repairs to dredge, derrick, pile driver, and pump boats; also repairs to operating machinery of lock gates.

*Snagging, dredging, etc.*—The snag boat *Swan* and repair steamer *Slackwater*, on their various trips along the river below Dam No. 9, removed 57 snags from the channel, besides also removing several pieces of wrecked boats. The *Swan* was engaged much of the time in towing service for new Lock No. 3, in crib building below locks in West Virginia and elsewhere, and tending dredge boats. During the season dredge boat *No. 1* removed from approaches to Lock No. 4, 1,100 cubic yards of material, and from old Lock No. 2, 15,400 cubic yards of material. Most of the time the dredge was at work at new Lock No. 3, banking cofferdams, etc., and old Lock No. 2, removing river wall of lock and part of dam, the stone saved from which was loaded into flats, taken to the Allegheny River and deposited below the bear-trap gates of Herr Island dam, where there had been much scouring.

A two days' rainfall on March 13 and 14 over the southern half of the watershed of the Ohio above Pittsburg resulted in a local flood which reached a stage, on the 15th, 2 feet higher than the floods of 1832 and 1884, the highest previously known. The second day's rain were concentrated in a district south and east of the city and so near that the rise reached the head of the Ohio very quickly. The rivers have remained too high to the end of the fiscal year to permit of a careful examination of the dams, but so far as can be determined they will require no extraordinary repairs. During the flood, steamers and fleets of vessels passed freely over the dams up to Dam No. 5, until stopped by insufficient clearance under bridges.



## Dimensions and other data of locks and dams on Monongahela River.

Characteristics.	Lock numbers.															
	1.	2.	3. (Old.)	3. (New.)	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
Distance from mouth.	1.95	11.20	25.0	23.8	41.24	58.92	68.67	82.74	87.55	93.8	102.6	104.95	109.85	111.80	115.50	124.10
When built.....	{ 1841 1853-4 1866 }	{ 1841 1853-4 1866 }	{ 1844 1863-4 1888 }	{ 1906-7 1886 }	{ 1844 1886 }	{ 1856 1886 }	{ 1856 1886 }	{ 1888 1888 }	{ 1882-9 1888 }	{ 1874-9 1874-9 }	{ 1897-08 1897-08 }	{ 1901-3 1901-3 }	{ 1901-3 1901-3 }	{ 1901-3 1901-3 }	{ 1901-3 1901-3 }	{ 1901-3 1901-3 }
When rebuilt.....	{ 1904-5 1904-5 }	{ 1904-5 1904-5 }	{ 1904-5 1904-5 }	{ 1906-7 1886 }	{ 1844 1886 }	{ 1856 1886 }	{ 1856 1886 }	{ 1888 1888 }	{ 1882-9 1888 }	{ 1874-9 1874-9 }	{ 1897-08 1897-08 }	{ 1901-3 1901-3 }	{ 1901-3 1901-3 }	{ 1901-3 1901-3 }	{ 1901-3 1901-3 }	{ 1901-3 1901-3 }
Lock: Size, feet.....	{ 50x158 56x216 56x360 }	{ 50x158 56x360 56x360 }	{ 50x158 56x360 56x360 }	{ 56x360 56x360 56x360 }	{ 50x158 56x227 56x227 }	{ 50x158 56x227 56x227 }	{ 50x158 56x227 56x227 }	{ 50x158 56x227 56x227 }	{ 50x158 56x227 56x227 }	{ 50x158 56x227 56x227 }	{ 56x182 56x182 56x182 }	{ 56x182 56x182 56x182 }	{ 56x182 56x182 56x182 }	{ 56x182 56x182 56x182 }	{ 56x182 56x182 56x182 }	{ 56x182 56x182 56x182 }
Lift at low water.....	{ 4.4 7.8 10.3 }	{ 7.8 12.3 12.3 }	{ 7.44 10.0 10.0 }	{ 8.4 12.1 12.1 }	{ 11.15 8.8 8.8 }	{ 10.93 10.5 10.5 }	{ 13.3 9.6 9.6 }	{ 9.2 9.2 9.2 }	{ 10.6 10.2 10.2 }	{ 12.35 7.6 7.6 }	{ 10.67 8.5 8.5 }	{ 10.67 7.7 7.7 }	{ 10.67 8.0 8.0 }	{ 10.67 8.0 8.0 }	{ 10.67 8.0 8.0 }	{ 10.67 8.0 8.0 }
Guard.....	{ 696.7 696.7 }	{ 696.6 696.6 }	{ 716.3 716.3 }	{ 715.25 715.25 }	{ 719.78 726.18 }	{ 741.81 738.57 }	{ 753.57 753.57 }	{ 768.84 768.84 }	{ 775.0 775.0 }	{ 787.0 787.0 }	{ 798.58 798.58 }	{ 807.25 807.25 }	{ 817.92 817.92 }	{ 828.59 828.59 }	{ 838.25 838.25 }	{ 849.92 849.92 }
Elevation, upper sill.	{ 696.2 696.2 }	{ 698.6 698.6 }	{ 709.46 709.46 }	{ 707.08 707.08 }	{ 718.38 718.38 }	{ 730.28 730.28 }	{ 741.98 741.98 }	{ 754.19 754.19 }	{ 765.0 765.0 }	{ 775.55 775.55 }	{ 788.92 788.92 }	{ 797.59 797.59 }	{ 808.25 808.25 }	{ 818.92 818.92 }	{ 829.58 829.58 }	{ 840.25 840.25 }
Elevation, lower sill.	{ 698.7 698.7 }	{ 698.7 698.7 }	{ 709.46 709.46 }	{ 707.08 707.08 }	{ 718.38 718.38 }	{ 730.28 730.28 }	{ 741.98 741.98 }	{ 754.19 754.19 }	{ 765.0 765.0 }	{ 775.55 775.55 }	{ 788.92 788.92 }	{ 797.59 797.59 }	{ 808.25 808.25 }	{ 818.92 818.92 }	{ 829.58 829.58 }	{ 840.25 840.25 }
Founded on.....	Rock.	in gravel.	Gravel.	Rock.	Gravel.	Gravel.	Rock.	Rock.	Rock.	Rock.	Rock.	Rock.	Rock.	Rock.	Rock.	Rock.
Walls, height above floor.	{ 23.3 24.2 }	{ 23.8 24.1 }	{ 23.8 24.1 }	{ 31.5 25.8 }	{ 25.4 25.8 }	{ 26.6 26.6 }	{ 29.4 29.4 }	{ 26.0 26.0 }	{ 36.0 36.0 }	{ 27.5 27.5 }	{ 27.5 27.5 }	{ 26.5 26.5 }	{ 27.0 27.0 }	{ 27.0 27.0 }	{ 27.0 27.0 }	{ 27.0 27.0 }
Walls, base width.	12.0	{ 29.77 River wall. d16.4 105 }	{ 12.0 14.0 789 }	{ 16-20-22 360 860 150 None. }	{ 12.0 15.0 890 }	{ 14.0 None. }	{ 14.0 None. }	{ 14.5 34 86 238 None. }	{ 18.0 190 107 107 None. }	{ 11.6 180 175 65 None. }	{ 16.0 180.2 155.6 53.8 52.5 }	{ 14 and 15 100.3 162 91.2 None. }	{ 14 and 15 100 52.8 66 None. }	{ 14 and 15 None. 151.7 91 None. }	{ 14 and 15 100 152 90 None. }	{ 14 and 15 99.7 117 91 53 420 Concrete.
Upper guide wall, length.	300	300	275	360	310	118	120	86	107	175	155.6	162	52.8	151.7	152	117
Lower guide wall, length.	820	300	275	360	310	118	120	86	107	175	155.6	162	52.8	151.7	152	117
Upper guard wall, length.	195	150	225	150	166	108	130	238	107	65	53.8	91.2	66	91	90	91
Lower guard wall, length.	None.	None.	None.	None.	None.	None.	None.	None.	None.	None.	52.5	None.	None.	None.	None.	53
Dam: Length, feet.	92.5	908	689	684.96	708	620	625	525.5	600	410	445	500	447	425	433	420
Material.....	Timber, stone filled.	Concrete on stone piles.	Concrete on stone piles.	Concrete on stone piles.	Timber, stone filled.	Timber, stone filled.	Timber, stone filled.	Timber, stone filled.	Timber, stone filled.	Masonry.	Concrete.	Concrete.	Concrete.	Concrete.	Concrete.	Concrete.
Elevation of crest.	707.4	718.25	723.1	723.9	734.98	746.41	760.15	770.0	780.8	788.4	804.66	815.38	826.0	836.67	847.33	858.0
Founded on.....	Gravel.	in gravel.	Gravel.	in gravel and sand.	Gravel.	Gravel.	Gravel.	Gravel.	Gravel.	Rock.	Rock.	Rock.	Rock.	Rock.	Rock.	Rock.

a About pool full Davis Island Dam.

b Upper guard sill, 707.1.

c Lower guard sill, 699.25.

d Middle wall, 20 feet.



## ALLOTMENTS.

August 15, 1884.....	\$1,000.00	July 28, 1896.....	\$19,232.84
September 1, 1884.....	4,000.00	July 15, 1897.....	<sup>a</sup> 13,070.87
November 3, 1884.....	4,500.00	August 2, 1897.....	<sup>b</sup> 119,734.49
December 20, 1884.....	500.00	October 8, 1897.....	125.00
June 1, 1885.....	100.00	September 1, 1898.....	<sup>c</sup> 197,627.93
July 22, 1885.....	1,000.00	August 14, 1899.....	169,838.00
July 10, 1886.....	1,200.00	September 7, 1900.....	175,474.96
March 1, 1887.....	1,100.00	August 5, 1901.....	159,266.46
July 1, 1887.....	11,000.00	July 26, 1902.....	237,963.86
July 11, 1888.....	6,270.00	August 4, 1903.....	200,949.31
October 27, 1888.....	3,000.00	August 10, 1903.....	21,050.00
July 17, 1889.....	1,480.00	November 18, 1903.....	<sup>d</sup> 21,500.00
October 7, 1889.....	1,500.00	July 22, 1904.....	<sup>e</sup> 255,381.10
November 6, 1889.....	1,200.00	July 20, 1905.....	205,881.69
July 24, 1890.....	12,300.00	January 13, 1906.....	<sup>f</sup> 10,000.00
July 8, 1891.....	24,250.00	July 19, 1906.....	234,787.44
July 21, 1892.....	34,017.86	Receipts from other	
July 21, 1893.....	23,574.72	sources.....	3,720.32
July 23, 1894.....	25,664.00		
July 12, 1895.....	20,372.40	Total.....	2,223,633.25

*Statement of expenditures for operating and care of locks and dams Monongahela River, West Virginia and Pennsylvania, during the fiscal year 1907.*

Item.	Amount.
Salaries and wages for regular hired labor force.....	\$156,766.76
Miscellaneous supplies and services.....	8,933.65
Dam, lock, boat, and boat-yard supplies and repair material not otherwise provided for.	83,596.16
Repairs to repair plant and additional pieces of same.....	13,860.26
Rebuilding, repairs not otherwise provided for, dredging, and removing of obstructions..	34,213.79
Total.....	242,365.62

## CONTRACTS IN FORCE.

## BUILDING AND DELIVERING ON BARGES OR FLATS AT PITTSBURG, PA., A STEEL LOCK GATE AND ANCHORAGE.

Contractor: Lawrence D. Weaning, Cleveland, Ohio.

Rates: Nickel steel, 6½ cents per pound; iron and steel castings, 5 cents per pound; bronze, 25 cents per pound; white oak, \$85 per M feet B. M.

Supplemental contract, providing for change in method of payment.

Dates of approval: Original contract <sup>g</sup>; supplemental contract, February 1, 1906.

Date of beginning work: October 21, 1904.

Date of expiration: June 1, 1905.

## BUILDING A WOODEN-HULL TOWBOAT AND DELIVERING SAME AT PITTSBURG, PA.

Contractor: J. M. Hammitt, Marietta, Ohio.

Rate: \$17,370.

Date of approval: March 31, 1906.

Date of beginning work: April 3, 1906.

Date of expiration: June 12, 1906 (extended for a reasonable period).

<sup>a</sup> Locks 8 and 9.

<sup>b</sup> Locks 1 to 7, inclusive.

<sup>c</sup> Locks 1 to 9, inclusive.

<sup>d</sup> Locks 10 to 15.

<sup>e</sup> Locks 1 to 15.

<sup>f</sup> For removing old Lock and Dam 2.

<sup>g</sup> Emergency.

## COMMERCIAL STATISTICS.

*Lockages made and traffic passed at Monongahela River locks during year ending June 30, 1907.*

At dams—	Lockages.		Steamboats.		Coal boats, barges, flats, and boat bottoms.		Rafts.	
	Up.	Down.	Up.	Down.	Up.	Down.	Up.	Down.
	Number.	Number.	Number.	Number.	Number.	Number.	Number.	Number.
1 .....	10,777	10,394	6,911	6,882	19,222	18,728	97	17
2 .....	6,279	6,287	6,437	6,445	23,388	23,200	66	14
3 .....	9,964	9,893	6,619	6,610	23,738	23,562	12	38
4 .....	9,376	9,818	6,198	6,291	20,857	20,404	8	42
5 .....	2,761	2,822	2,283	2,239	2,308	2,282	2	52
6 .....	823	886	446	450	888	400	8	49
7 .....	714	749	458	444	201	213	8	42
8 .....	911	973	702	701	213	239	8	47
9 .....	719	764	684	639	202	215	8	18
10 .....	323	344	202	206	156	163	.....	24
11 .....	308	335	181	183	205	213	1	28
12 .....	302	321	192	192	158	166	1	22
13 .....	213	221	148	152	105	110	.....	9
14 .....	231	238	150	151	92	102	.....	9
15 .....	351	358	244	242	70	86	5	12
Aggregate .....	44,042	43,903	29,750	29,826	90,748	90,113	199	423

At dams—	Other craft.		Coal.		Coke.		Rails, steel.	
	Up.	Down.	Up.	Down.	Up.	Down.	Up.	Down.
	Number.	Number.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.
1 .....	554	597	5,680	4,662,960	.....	2,675	10	8
2 .....	391	411	10,184	8,094,932	.....	.....	25	.....
3 .....	188	187	3,228	9,139,780	.....	.....	.....	.....
4 .....	222	203	1,796	7,912,000	.....	.....	65	7
5 .....	78	86	408	642,688	.....	.....	16	.....
6 .....	296	306	420	100,180	.....	.....	23	2
7 .....	256	267	523	18,920	.....	.....	1	.....
8 .....	237	254	400	19,088	.....	.....	10	.....
9 .....	106	118	80	17,999	.....	.....	5	.....
10 .....	143	154	388	12,773	.....	.....	.....	.....
11 .....	100	103	444	12,869	.....	.....	.....	.....
12 .....	120	116	406	12,840	.....	.....	.....	.....
13 .....	81	79	336	12,908	.....	.....	.....	.....
14 .....	89	80	.....	12,720	.....	.....	.....	.....
15 .....	146	158	54	12	.....	.....	.....	5
Aggregate .....	3,011	3,109	24,352	30,672,869	.....	2,675	155	17

At dams—	Other iron or steel products.		Sand.		Gravel.	
	Up.	Down.	Up.	Down.	Up.	Down.
	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.
1 .....	18,061	24,635	450,231	47,515	1,064,666	8,276
2 .....	5,811	10,026	126,481	113,483	733,647	2,669
3 .....	4,139	4,491	15,997	220,780	45,082	.....
4 .....	1,791	11,434	50,738	483	31,069	3,311
5 .....	2,180	265	3,347	777	6,320	206
6 .....	1,808	227	245	688	551	69
7 .....	1,389	185	207	812	551	69
8 .....	1,204	196	207	847	551	.....
9 .....	796	84	923	.....	551	69
10 .....	44	23	379	.....	648	276
11 .....	37	23	335	.....	676	379
12 .....	41	22	311	172	1,048	414
13 .....	35	26	262	138	324	133
14 .....	27	22	248	138	207	69
15 .....	84	62	.....	.....	.....	.....
Aggregate .....	37,897	51,721	667,911	385,833	1,875,830	15,935

*Lockages made and traffic passed at Monongahela River locks during year ending June 30, 1907—Continued.*

At dams—	Stone.		Brick.		Timber.	
	Up.	Down.	Up.	Down.	Up.	Down.
	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.
1	2,370	5,876	11		14,790	1,377
2	147	9,594			11,915	2,591
3	700	986			2,295	6,251
4	768	2,270	12		2,255	8,093
5	753	1,982	290		109	5,780
6	706	988	8		104	6,245
7	706	988		6	40	5,143
8	3,151	1,123		165	142	5,545
9	177	412		171	112	2,611
10	177	441			40	2,448
11	623	429			54	2,349
12	1,471	365			57	2,329
13	647	454			40	1,282
14	267				40	986
15	225	248				348
Aggregate	12,483	26,151	321	342	31,993	53,327

At dams—	Lumber.		Lath and shingles.		Pit posts.	
	Up.	Down.	Up.	Down.	Up.	Down.
	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.
1	7,406	667	146		10,000	
2	7,373	1,286	108		11,405	
3	2,997	802	107		7,525	
4	1,491	158			4,650	225
5	652	1,346	392		50	4,900
6	473	1,582	112			5,063
7	525	1,752				4,988
8	677	1,860		3	2	5,651
9	287	1,527			8	5,143
10	406	1,061				4,268
11	374	1,064				4,217
12	329	1,051				2,405
13	140	851				850
14		253				
15	46	299				
Aggregate	23,124	14,459	865	3	33,640	37,235

At dams—	Mine braces.		Ties, railroad.		Wood.		General merchandise.	
	Up.	Down.	Up.	Down.	Up.	Down.	Up.	Down.
	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.
1	588		3,750				7,612	19,592
2	1,110		3,200				7,627	9,135
3	560		8,340	400			7,879	2,318
4	260		1,000				7,090	2,190
5				12,608			6,102	2,418
6				13,207			4,949	1,586
7				8,262	12		2,994	1,254
8		1	3,286			88	2,170	989
9			3,179			30	1,692	884
10			2,947			27	287	115
11			1,814				266	158
12			1,595				275	120
13		4					238	116
14		8					219	107
15			1				205	160
Aggregate	2,518	13	11,291	42,298	12	95	49,605	41,092

# 1696 REPORT OF THE CHIEF OF ENGINEERS, U. S. ARMY.

*Lockages made and traffic passed at Monongahela River locks during year ending June 30, 1907—Continued.*

At dams—	Farm, dairy, and orchard products.		Live stock, large.		Live stock, small.	
	Up.	Down.	Up.	Down.	Up.	Down.
	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.
1 .....	1,600	61	602	836	1	49
2 .....	1,566	99	721	859	1	48
3 .....	1,475	139	648	474	1	23
4 .....	1,434	258	562	283	1	47
5 .....	913	154	264	171	2	44
6 .....	649	114	196	144	1	35
7 .....	275	40	87	71	1	
8 .....	166	25	86	56	3	
9 .....	113	31	79	56	3	
10 .....	12	4	23	13	3	
11 .....	16	4	25	14	3	
12 .....	15	4	24	13	3	
13 .....	13	4	24	13	3	
14 .....	16		24	14	3	
15 .....	15	2	25	14	3	
Aggregate .....	8,278	939	3,390	2,030	32	246

At dams—	Passengers.		Total tonnage.	
	Up.	Down.	Up.	Down.
	Number.	Number.		
1 .....	22,044	20,794	1,586,513	4,774,022
2 .....	20,572	18,586	921,321	8,244,162
3 .....	15,797	14,880	95,923	9,375,944
4 .....	12,866	11,692	113,977	7,940,769
5 .....	25,985	21,281	21,748	673,339
6 .....	7,670	7,274	10,245	130,100
7 .....	6,368	6,318	7,316	37,490
8 .....	7,429	7,287	8,769	38,822
9 .....	6,253	6,263	4,776	32,196
10 .....	2,211	2,309	2,406	24,591
11 .....	2,125	2,220	2,852	23,320
12 .....	2,075	2,132	3,980	21,330
13 .....	2,231	2,361	2,062	15,784
14 .....	2,226	2,299	1,051	14,316
15 .....	8,819	3,942	658	1,145
Aggregate .....	139,621	129,088	2,783,597	31,347,230

## Total commerce of the river.

Fiscal year.	Products.	Passengers.
	Tons. <sup>a</sup>	Number.
1902 .....	9,100,887	181,527
1903 .....	11,369,814	101,457
1904 .....	9,268,736	116,174
1905 .....	9,211,752	78,458
1906 .....	11,447,444	77,134
1907 .....	11,817,128	47,216

<sup>a</sup> 2,000 pounds.

The total commerce of the Monongahela River is estimated by taking the aggregate of the greatest items of the different kinds of freight passing up and down at any single lock plus the coal mined and shipped in pools 1 and 2, which amount is manifestly less than the real movement of commerce.

*Monthly lockages of vessels at different dams.*

Lock No.—	1906.						1907.						Total.
	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	
1.....	1,943	1,987	1,362	1,836	1,681	2,281	1,054	1,452	1,797	2,014	2,088	1,726	21,171
2.....	1,035	1,097	951	1,118	1,091	1,101	756	940	980	1,201	1,200	1,096	12,566
3.....	1,543	1,624	1,451	1,709	1,719	1,735	1,246	1,677	1,515	1,872	1,993	1,763	19,847
4.....	1,425	1,404	1,544	1,797	1,612	1,547	1,139	1,500	1,449	1,769	1,803	1,705	18,694
5.....	615	304	388	573	549	431	288	401	397	519	555	563	5,583
6.....	163	145	130	184	160	143	92	122	139	133	151	147	1,709
7.....	204	150	219	176	108	80	50	61	62	100	127	126	1,468
8.....	190	163	203	199	170	133	79	130	96	166	197	168	1,884
9.....	134	113	145	175	133	112	55	69	65	142	177	163	1,483
10.....	83	72	65	79	58	23	9	28	17	38	99	96	667
11.....	55	85	67	94	70	23	5	31	16	30	95	82	643
12.....	55	67	58	71	73	26	5	85	16	48	92	77	623
13.....	40	45	25	51	46	21	5	14	16	25	76	70	434
14.....	67	86	24	47	11	16	3	8	17	27	85	78	469
15.....	190	205	68	34	18	8	1	1	7	28	66	83	709
Total.....	7,742	7,537	6,690	8,143	7,499	7,680	4,787	6,469	6,589	8,112	8,754	7,943	87,945

The locks were temporarily closed to navigation for times and reasons as follows:

Locks.	Repairs.	Floods.	Total time.	Number of times.
No. 1:	<i>d. h. m.</i>	<i>d. h. m.</i>	<i>d. h. m.</i>	
Large.....	28 15 0	12 5 15	40 20 15	6
Small.....	20 13 45	12 5 15	32 19 0	6
No. 2:				
Inside.....		14 6 0	14 6 0	4
Outside.....		14 6 0	14 6 0	4
No. 3:				
Large.....	1 5 0	15 23 45	17 4 45	6
Small.....		15 23 45	15 23 45	5
No. 4:				
Large.....	11 16 0	13 23 30	25 15 30	9
Small.....		13 23 30	13 23 30	7
No. 5.....	8 0 0	11 3 15	19 3 15	7
No. 6.....		7 10 10	7 10 10	5
No. 7.....	0 10 0	13 1 30	13 11 30	7
No. 8.....		10 2 30	10 2 30	5
No. 9.....		16 7 45	16 7 45	6
No. 10.....		5 3 0	5 3 0	3
No. 11.....		5 19 0	5 19 0	4
No. 12.....		5 7 30	5 7 30	6
No. 13.....		9 5 0	9 5 0	6
No. 14.....		10 17 0	10 17 0	6
No. 15.....		7 11 0	7 11 0	6

## F F 4.

## IMPROVEMENT OF ALLEGHENY RIVER, PENNSYLVANIA, OPEN-CHANNEL WORK.

This work was in local charge of Mr. J. W. Arras, assistant engineer, from July 1, 1906, to October 3, 1906, and of Mr. J. B. Dimmick, assistant engineer, from November 1, 1906, to June 30, 1907.

All the channel work accomplished during the fiscal year 1907 was done during August, September, and October of 1906.

The dam at Hickory ripple (159.3 miles from the mouth) was thoroughly repaired and all dislodged paving replaced.

The dam at Pithole ripple (142.4 miles from the mouth) was repaired by removing old and decayed timbers and paving the spaces left with stone. About 350 cubic yards of bowlders secured from the channel were placed at the island end of the dam, and about 10 cubic

yards at its foot, in order to prevent the water from cutting around its ends.

At Nicholson's Island (about 35 miles from the mouth) decayed timbers were replaced with new ones; 225 cubic yards of riprap stone and large bowlders were placed in the lower slope of dam; 40 square yards of paving were restored, and about 75 cubic yards of gravel filling were deposited in the voids of the lower slope stone filling.

A large arch culvert about 1 mile above Freeport was scoured out by excessive rain in that section, during the early part of the summer of 1906, and was deposited in the main channel of the river at that point along with other debris which had accumulated. About 160 cubic yards of stone, 70 cubic yards of bowlders, and 25 trees and snags were removed.

#### Money statement.

July 1, 1907, balance unexpended.....	\$4,247.87
June 30, 1907, amount expended during fiscal year, for maintenance of improvement.....	1,356.79
July 1, 1907, balance unexpended.....	2,891.08
July 1, 1907, outstanding liabilities.....	3.00
July 1, 1907, balance available.....	2,888.08
{ Amount that can be profitably expended in fiscal year ending June 30, 1909, for maintenance of improvement, in addition to the balance unexpended July 1, 1907.....	
Submitted in compliance with requirements of sundry civil act of June 4, 1897, and of section 7 of the river and harbor act of 1899.	
	10,000.00

#### APPROPRIATIONS.

March 3, 1879.....	\$10,000	August 18, 1894.....	\$12,500
June 14, 1880.....	20,000	June 3, 1896.....	12,500
March 3, 1881.....	25,000	March 3, 1899.....	15,000
August 2, 1882.....	15,000	August 17, 1900 (allotment).....	5,000
July 5, 1884.....	35,000	June 13, 1902.....	10,000
August 5, 1886.....	30,000	June 13, 1902 (allotment).....	5,000
August 11, 1888.....	25,000		
September 19, 1890.....	26,000	Total.....	265,000
July 13, 1892.....	25,000		

#### COMMERCIAL STATISTICS.

Articles.	Tons.*	Articles.	Tons.*
Barges.....	1,500	Posts.....	47,695
Bottoms, coal boat (new).....	3,168	Sand.....	212,513
Braces.....	368	Stone.....	2,962
Brick.....	44	Tan bark.....	185
Cement.....	40	Ties, railroad.....	5,131
Coal.....	27,208	Timber.....	21,522
General merchandise.....	22	Wood.....	183
Gravel.....	700,196		
Lath.....	151	Total.....	1,029,024
Lumber.....	6,116		

\* 2,000 pounds.



## F F 5.

ALLEGHENY RIVER, PENNSYLVANIA, CONSTRUCTION OF LOCKS  
AND DAMS.

This work was in local charge of Mr. J. W. Arras, assistant engineer, from July 1, 1906, to October 3, 1906, and of Mr. J. B. Dimmick, assistant engineer, from November 1, 1906, to June 30, 1907.

*Lock and Dam No. 2.*—The furnishing and erecting of two pairs of steel lock gates and anchorages by the Penn Bridge Company was completed, the operating spars and other devices installed, and the lock completed for operation November 10, 1906. The quantities of materials furnished and placed under this contract and the cost thereof in unit quantities were as follows:

Item.	Designation.	Quantities.	Price per unit.
White oak .....	Feet B. M. ....	2, 773	\$60.00 M.
Iron, steel, and bronze.....	Pounds.....	250, 262	.0488

Operations in connection with the building of the dam were continued by the Jas. H. McQuade Company. The quantities of materials furnished and placed or work done under this contract and the cost thereof in unit quantities were as follows:

Item.	Designation.	Quantities.	Price per unit.
Gravel excavation .....	Cubic yards .....	8, 023	\$0.60
Round piles .....	Linear feet .....	8, 225	.45
Sheet piles.....	Feet B. M. ....	77, 356	70.00 M.
Oak timber.....	do .....	128, 680	70.00 M.
Hemlock timber.....	do .....	156, 727	50.00 M.
Stone crib filling .....	Cubic yards .....	8, 352	2.50
Concrete .....	do .....	8, 800	7.00
Driftbolts .....	Pounds.....	34, 861	.05
Back fill .....	Cubic yards .....	1, 488	.60
Embankment .....	do .....	6, 140	.60

On account of the river conditions being so unfavorable, no actual construction work has been done since about November 15, 1906.

In September, 1906, a contract was entered into with Pihl & Miller, of Pittsburg, Pa., to construct a reenforced concrete power conduit leading from an opening in the upper guide wall along behind the land wall of the lock to an opening below same in the lower guide wall. It was proposed to use this conduit at some future time in connection with the furnishing of water power to operate the lock. The conduit is completed, and there remain only a few forms to be removed. The quantities of materials furnished and placed or work done under this contract and the cost thereof in unit quantities were as follows:

Item.	Designation.	Quantities.	Price per unit.
Excavation.....	Cubic yards .....	1, 927	\$0.60
Concrete .....	do .....	230	7.85
Steel .....	Pounds.....	16, 069	.04

The filling of the lock grounds, arranged for with the Pennsylvania Railroad Company, which is to be done practically free of charge, was carried on almost continuously during the year until about May, 1907, when a temporary pause was made owing to the railroad company needing the material for its own use at different points along its road. The total amount deposited was 41,409 cubic yards of furnace slag and other material.

About March 1 the contractor for the dam expressed his willingness to allow the United States to build the submerged crib below the dam along the face of the abutment, covered by his contract, provided the United States would buy all the materials that he had on hand for the construction of this crib. A supplemental agreement was made covering these points.

Plans were also drawn up for the strengthening of the abutment and were approved by the Chief of Engineers, United States Army, on March 26, 1907. Nearly all materials needed to do these items of work by hired labor have been ordered and partly received. The necessary plant has been installed and the prosecution of the work awaits favorable weather and river conditions.

*Lock and Dam No. 3.*—The lock was in operation throughout the year.

A contract for the building of a second lock house was entered into with the New Kensington Lumber Company on September 4, 1906. This house was completed at a cost of \$3,595.70.

During the moderate flood of January 15, 1907, the abutment at Dam No. 3 failed through some unexplained cause and was totally destroyed. In order to limit the damage to adjoining property it was decided to destroy a portion of the dam. Accordingly, a portion of the dam in midstream, 560 feet long and ranging in depth from 12 to 13 feet below the crest, was blown out with dynamite. A plan for rebuilding the abutment, repairing the damaged portion of the dam and lowering the remaining portion was approved by the Chief of Engineers, United States Army, on April 29, 1907. Most of the material needed on this work has been ordered and considerable has been received. Nearly all the necessary plant is on the ground or arrangements made for same. A crew of about 20 men have been employed since May 19 lowering the crest of that portion of the dam remaining, and about 125 linear feet of the dam have thus been lowered.

*Harbor lines, Allegheny River, from Pittsburg to Natrona.*—The establishment of harbor lines on the Allegheny River from Pittsburg to Natrona, Pa., was authorized May 11, 1906.

A party of 12 men started the field survey about one-half of a mile above Brilliant. A triangulation system was located and the stations marked by concrete monuments with lettered brass plates in top at ground surface. Base lines were measured by standardized steel tape at intervals of about  $1\frac{1}{2}$  miles. Angles were read by repeating six times and triangles closed usually within 5 seconds. The measured and computed lengths of base lines agreed usually within 0.15 of a foot and was kept under 0.2 of a foot.

The bank outlines, shore lines, etc., were located by stadia, but most of the important structures of permanent character were connected with triangulation stations by steel tape. Cross sections of banks

were taken by hand level from top to low water at intervals of about 250 feet.

The coordinates of the triangulation stations were computed in extension of the rectangular system used for the Pittsburg harbor survey, the origin being at Davis Island dam.

The field work was closed November 21, 1906.

The length of main river channel surveyed is 18.1 miles, and of "back" channels at islands, 5.8 miles. There were 176 triangles measured, marked by 185 monuments and plates and checked by 12 base lines.

The survey was first plotted on long sheets of drawing paper, then on 15 sheets of tracing linen. A tentative location of harbor lines has been placed on the maps first plotted.

### *Money statement.*

July 1, 1906, balance unexpended.....	\$290, 303. 85
Amount appropriated by river and harbor act approved March 2, 1907..	235, 000. 00
Amount received from sale of blueprints.....	18. 45
	<hr/>
	525, 322. 30
June 30, 1907, amount expended during fiscal year, for works of improvement.....	214, 794. 52
	<hr/>
July 1, 1907, balance unexpended.....	310, 527. 78
July 1, 1907, outstanding liabilities.....	81, 525. 55
	<hr/>
July 1, 1907, balance available.....	229, 002. 23
	<hr/>
July 1, 1907, amount covered by uncompleted contracts.....	79, 380. 70

### APPROPRIATIONS.

August 5, 1886.....	\$37, 500. 00	June 28, 1902.....	\$118, 500. 00
August 11, 1888.....	35, 000. 00	March 3, 1905 (allotment).....	10, 000. 00
September 19, 1890.....	35, 000. 00	June 30, 1906.....	281, 226. 63
July 13, 1892.....	40, 000. 00	March 2, 1907.....	235, 000. 00
August 18, 1894.....	40, 000. 00	Received from other sources.....	170. 70
June 3, 1896.....	50, 000. 00		
June 4, 1897.....	350, 000. 00		
July 1, 1898.....	300, 000. 00		
March 3, 1901.....	126, 000. 00	Total.....	1, 658, 397. 33

### CONTRACTS IN FORCE.

#### BUILDING DAM NO. 2 AT SIXMILE ISLAND, ALLEGHENY RIVER.

Contractor: James H. McQuade Company, Pittsburg, Pa.

Rates: Gravel excavation, 60 cents per cubic yard; back fill, 60 cents per cubic yard; embankment, 60 cents per cubic yard; round piles, 45 cents per linear foot; sheet piles, \$70 per M feet B. M.; oak timber, \$70 per M feet B. M.; hemlock timber, \$50 per M feet B. M.; stone crib filling, \$2.50 per cubic yard; large stone, \$2.50 per cubic yard; concrete, \$7 per cubic yard; driftbolts, 5 cents per pound.

Date of approval: May 13, 1905.

Date of beginning work: June 14, 1905.

Date of expiration: November 30, 1906 (extended for a reasonable period).

## 1702 REPORT OF THE CHIEF OF ENGINEERS, U. S. ARMY.

### BUILDING AND ERECTING IN PLACE TWO PAIRS OF STEEL LOCK GATES AND ANCHOR-AGES AT LOCK NO. 2, ALLEGHENY RIVER.

Contractor: Penn Bridge Company, Beaver Falls, Pa.

Rates: White oak, \$60 per M feet B. M.; iron, steel, and bronze, 4.88 cents per pound.

Date of approval: June 28, 1905.

Date of beginning work: July 18, 1905.

Date of expiration: July 31, 1906.

### CONSTRUCTING TWO LOCKS AND DAMS ON ALLEGHENY RIVER AT SIXMILE ISLAND (NO. 2) AND AT SPRINGDALE (NO. 3).<sup>a</sup>

Contractor: Sloan, McIlvain & Ott Brothers, Allegheny, Pa.

Lock and Dam No. 3.

Rates: Original contract. Lock and abutment. Grubbing and clearing, \$142; earth excavation, 12 cents per cubic yard; hardpan excavation, 75 cents per cubic yard; rock excavation, \$1.75 per cubic yard; embankment, \$2.19 per cubic yard; concrete of natural cement, \$4.18 per cubic yard; concrete of Portland cement, \$5.57 per cubic yard; stone filling in cribs, \$1 per cubic yard; stone paving of cribs, \$1.10 per square yard; stone paving of river bank, \$1.40 per square yard; white oak in gates, \$47 per M feet B. M.; white oak in quoins and sills, \$60 per M feet B. M.; white oak in cribs, abutments, and gate spars, \$44 per M feet B. M.; hemlock in cribs, \$19.50 per M feet B. M.; button-head driftbolts in cribs, 1.7 cents per pound.

Rates: Original contract. Dam. White oak timber, \$30 per M feet B. M.; hemlock timber, \$19.50 per M feet B. M.; white-oak sheeting on back of dam, \$28 per M feet B. M.; riprap stone filling, \$1.07 per cubic yard; button-head driftbolts, 1.7 cents per pound; dredging, foundation, 16 cents per cubic yard; refilling for dams, 15 cents per cubic yard; backing of dam, 15 cents per cubic yard; hemlock piles in place, \$4.32 each; hemlock sheeting and scantling, in foundation, \$16 per M feet B. M.

Rates: Supplemental contract, covering additional work at the following prices: Oak piles, \$8.62 each; white oak lumber, \$40 per M feet B. M.; hemlock lumber, \$27.50 per M feet B. M.; button-head driftbolts, 3 cents per pound; protection stone below dam, \$2.25 per cubic yard; riprap stone filling, if any, \$1.20 per cubic yard; gravel filling in dam, 30 cents per cubic yard.

Dates of approval: Original contract, July 8, 1897; supplemental contract, July 13, 1901.

Date of beginning work: May 25, 1898.

Date of expiration: September 26, 1901 (extended for a reasonable period).

### BUILDING A REINFORCED CONCRETE POWER CONDUIT AT LOCK NO. 2, ALLEGHENY RIVER.

Contractor: Pihl & Miller, Pittsburg, Pa.

Rates: Excavation, 60 cents per cubic yard; concrete, \$7.85 per cubic yard; steel, 4 cents per pound.

Date of approval:<sup>b</sup>

Date of beginning work: September 10, 1906.

Date of expiration: September 25, 1906 (extended for a reasonable period).

### FURNISHING ABOUT 20,000 TONS OF RIPRAP STONE BELOW ABUTMENT OF DAM NO. 3, ALLEGHENY RIVER, SPRINGDALE, PA.

Contractor: Joseph Heidenkamp, Springdale, Pa.

Rate: \$1.05 per ton of 2,000 pounds.

Date of approval:<sup>b</sup>

Date of beginning work: September 8, 1905.

Date of expiration: May 8, 1906.

<sup>a</sup> By supplemental contract dated November 29, 1901, approved by Secretary of War December 13, 1901; this contract was abrogated so far as it pertained to lock and dam at Sixmile Island (No. 2).

<sup>b</sup> Emergency.

## BUILDING A LOCK MASTER'S DWELLING AT LOCK NO. 3, ALLEGHENY RIVER.

Contractor: New Kensington Lumber Company, New Kensington, Pa.

Rate: \$3,595.70.

Date of approval:<sup>a</sup>

Date of beginning work: September 9, 1906.

Date of expiration: December 19, 1906 (extended for a reasonable period).

## F F 6.

## OPERATING AND CARE OF LOCKS AND DAMS, ALLEGHENY RIVER, PENNSYLVANIA.

This work was in local charge of Mr. J. W. Arras, assistant engineer, from July 1, 1906, to October 3, 1906, and of Mr. J. B. Dimmick, assistant engineer, from November 1, 1906, to June 30, 1907.

*Lock and Dam No. 1.*—This structure has been in use since December 31, 1902, and was successfully operated during this fiscal year. The movable dam was raised and lowered four times and was up one hundred and twenty-two days in all.

After lowering the dam on November 16, 1906, a complete survey with soundings was made below the bear-trap weirs. This survey developed the fact that it was advisable to protect the gravel bottom below weirs from further scour. Scour occurs while the pass is up and the bear traps down. The area of river bottom below the weirs between the apron crib and a line about 80 feet below and parallel to same was covered with a layer of small stone about 3 feet thick, and on top of that was placed a layer of large derrick stone about 5 to 6 feet thick. The stone was waste material obtained while removing part of old Lock and Dam No. 2, Monongahela River. The approximate number of cubic yards of small stone placed was 1,930; approximate number of cubic yards of large stone placed was 3,300.

At the beginning of the fiscal year only the bearing piles of the proposed retaining wall below the abutment of this dam were driven. The proposed structure comprised a concrete retaining wall about 200 feet long on round bearing piles, the material beneath to be protected from scour by a row of triple-lap sheet piles driven along the river face and well into the bottom, and further protected by depositing large riprap stone along the river face of wall. The wall was completed according to plans during February, 1907.

In addition to the operation of the lock and dam and other routine work in connection therewith the regular force was employed installing and operating pumping plant for unwatering lock chamber at Lock No. 2, for the erection of steel lock gates, assisting in construction of retaining wall, and the placing of large stone below bear-trap weirs and installing gate-operating devices at Lock No. 2.

The following table shows dates of raising and lowering of dam:

Raised.	Lowered.	Days up.
Up at beginning of fiscal year.....	August 21, 1906 .....	52
August 26, 1906.....	November 16, 1906 .....	53
April 27, 1907.....	April 24, 1907.....	3
May 16, 1907.....	May 28, 1907 .....	14
Total.....		122

<sup>a</sup> Emergency.

*Lock and Dam No. 2.*—While the dam at this lock is not yet completed, the status of the work is such that it is dangerous at all times to go through the 90-foot gap and quite impracticable for certain classes of traffic. The lock has accordingly been operated since November, 1906; from November 10, 1906, to April 24, 1907, by the inspection force employed in connection with the construction of the dam, and since April 24 by a regular operating force.

*Lock and Dam No. 3.*—This lock and dam were put in operation November 29, 1904, and continued in service when river conditions would permit until January 15, 1907, when, during the moderate flood of that date, the abutment failed through some undetermined cause, carrying away nine dwelling houses, outbuildings, and other property, and about 5.3 acres of land adjoining the abutment.

The failure was first noticed at about 12.30 p. m. on January 15, 1907. The upper gauge at the lock at that time read 16.9 feet (elevation 741.9) and the lower gauge 19.4 feet (elevation 733.4), making a fall of 8.5 feet at the dam when the break was first noticed. In about three hours the entire abutment, with wing walls and concrete slope protection, was undermined and overturned or carried away, leaving nothing but a very unsubstantial bank, consisting of sand and loam, with some gravel mixed with it, to withstand the rush of the water around the abutment end of the dam. The bank was rapidly eroded, carrying dwelling houses and outbuildings with it.

The Pennsylvania Railroad Company was at once requested to put in necessary tracks along the bank which was endangered and to procure and rush small and derrick stone, slag, or other heavy materials to the site of the break. The first track laid was about 600 feet long and was placed about 220 feet back from the original top of the bank. Some stone and slag were dumped from this siding on the 16th, but about 3 p. m. it was decided that this track would be washed away before sufficient material could be accumulated to hold the bank at that point, and it was then abandoned and material dumped along the siding 80 feet farther back, next the Pennsylvania Railroad Company's main track. Tracks were then laid all along the bank as cut and at such distances from the edge as were considered safe. The unloading of large and small stone and slag was carried on during the 17th, 18th, 19th, and 20th, using two wrecking cranes, a derrick car, and 275 laborers, besides about 150 men working on side tracks. The force was then reduced and work of placing stone along the bank to prevent further scour was continued with a gradually diminishing force until February 15, when it was considered that all necessary work had been done to protect adjoining property from further damage. The entire bank attacked was thoroughly riprapped with large and small stone, using about 23,479 tons. The area of land washed away, roughly, approximates a segment of a circle. The length of the arc or bank as it now stands is about 1,200 feet, and the greatest recession of bank line measures about 240 feet. The work in connection with limiting damage from the above failure was done under allotments of \$60,000 and \$20,000 made on January 24 and February 24, respectively.

Orders were issued January 16 to blast out about 500 linear feet of the top 12 feet of the dam in the middle of the stream. By noon on the 18th there was a gap in the dam about 325 feet wide, and this was widened to over 400 feet before the day was over. The next day 100

linear feet more were removed, and later about 600 feet, making a total of 560 linear feet of the top of the dam blasted off. Generally, the dam is destroyed for the above distance from the crest down about 12 or 13 feet. It may be seriously damaged for a greater depth, but the river conditions to date have been such as to make it impracticable to determine the conditions of the lower part of dam. The undamaged portion of the dam remaining is a part about 175 feet long, extending from the river wall toward the abutment. A part about 167 feet long, extending from the face of the abutment as built toward the lock, has only the sheeting and first three courses of timber missing. This part of the dam was intact for two months after the blasting operation, but was found to be damaged after the subsidence of the flood of March 15, 1907.

Owing to the fact that a large portion of the dam was blown out since January 15, the lock has only been operated at times when there was sufficient water over the upper sill of lock to allow of the passage of traffic; at other times some traffic, such as timber rafts and barges, have gone through the gap blown in the dam.

*Dimensions and other data of locks and dams on Allegheny River.*

Characteristics.	Lock number.		
	1.	2.	3.
Distance from mouth miles.....	1.8.....	6.9.....	16.5.....
When built.....	1893-1899.....	Under contract.....	
Lock:			
Size.....	55 by 286 feet 2 inches.	56 by 289 feet 6 inches.	56 by 289 feet 6 inches.
Lift at low water.....	7 feet.....	11 feet.....	12 feet.....
Guard.....	6 feet.....	10 feet.....	9.5 feet.....
Elevation, uppersill.....	695 feet.....	713 feet.....	725 feet.....
Elevation, lower sill.....	695 feet.....	699 feet.....	714 feet.....
Founded on.....	Gravel.....	Rock.....	Shale and hardpan.
Height of lock walls above floor.....	40-22 feet.....	28 feet.....	29 feet.....
Width of lock walls at base.....	9 feet.....	16 feet.....	16 feet.....
Upper guide wall, length.....		250 feet.....	64.5 feet.....
Lower guide wall, length.....		250 feet.....	38 feet.....
Upper guard wall, length.....	150 feet.....	200 feet.....	50 feet.....
Lower guard wall, length.....	150 feet.....		48 feet.....
Dam:			
Length.....	10 feet.....	1,215 feet.....	909 feet.....
Material.....	Concrete foundation.....	Concrete.....	Timber, stone, and gravel.
Elevation of crest.....	711 feet.....	721 feet.....	735-732 feet.....
Founded on.....	Gravel.....	Gravel.....	Gravel.....
Fall over at epoch of submergency of lock wall.....			8.5-10 feet.....
Abutment:			
Type.....	Concrete.....	Concrete.....	Paved with concrete.
Founded on.....	Piles and gravel.....	Crib on gravel.....	Cribs on gravel.....

ALLOTMENTS.

January 9, 1903.....	<sup>a</sup> \$9,611.00	July 23, 1906.....	<sup>c</sup> \$21,720.81
July 20, 1903.....	<sup>a</sup> 18,292.64	January 24, 1907.....	<sup>c</sup> 60,000.00
July 22, 1904.....	<sup>a</sup> 16,996.76	February 24, 1907.....	<sup>c</sup> 20,000.00
November 21, 1904.....	<sup>b</sup> 5,700.69	Received from other sources.....	9.06
February 10, 1905.....	<sup>b</sup> 3,000.00		
April 13, 1905.....	<sup>b</sup> 6,000.00		
July 27, 1905.....	<sup>c</sup> 28,657.86	Total.....	189,987.33

<sup>a</sup> Lock and Dam No. 1.

<sup>b</sup> Lock and Dam No. 3.

<sup>c</sup> Locks and Dams Nos. 1 and 3.

# 1706 REPORT OF THE CHIEF OF ENGINEERS, U. S. ARMY.

## Statement of expenditures for operating and care of locks and dams, Allegheny River, Pennsylvania, during the fiscal year 1907.

Item.	Amount.
Salaries and wages for regular hired labor force.....	\$23,000.11
Miscellaneous supplies and services.....	3,650.86
Miscellaneous repairs.....	54,407.28
Contingencies.....	1,946.10
Total.....	82,998.35

### COMMERCIAL STATISTICS.

#### Lockages made and traffic passed at Allegheny River locks during year ending June 30, 1907.

At dams—	Lock-ages.	Steam-boats.	Coal boats, barges, flats, and boat bot-toms.	Other craft.	Barges (new).	Boat bot-toms (new).
	<i>Number.</i>	<i>Number.</i>	<i>Number.</i>	<i>Number.</i>	<i>Number.</i>	<i>Number.</i>
1.....	130	354	390	124	5,820	3,564
2.....	509	275	564	802		
3.....	891	75	331	857	1,500	3,168
Aggregate.....	1,530	704	1,289	1,283	7,320	6,732

At dams—	Coal.	Iron products.	Sand.	Grave.	Stone.	Timber.
	<i>Tons.</i>	<i>Tons.</i>	<i>Tons.</i>	<i>Tons.</i>	<i>Tons.</i>	<i>Tons.</i>
1.....	284,850	66	113,280	14,687		21,703
2.....	117,028	208	210,580	875		580,569
3.....	464	1	1,670		122	21,330.5
Aggregate.....	402,342	275	325,530	43,062	122	623,602.5

At dams—	Lumber.	Lath.	Posts.	Braces.	Ties (railroad).	Wood.	Tan bark.
	<i>Tons.</i>	<i>Tons.</i>	<i>Tons.</i>	<i>Tons.</i>	<i>Tons.</i>	<i>Tons.</i>	<i>Tons.</i>
1.....	4,004	34	6,160	1,280	1,630		
2.....	931,531		71,450	3,512		145	
3.....	6,116	151	47,695	368		120	185
Aggregate.....	941,651	185	125,305	5,160	1,630	265	185

At dams—	General merchan-dise.	Total tonnage.	Passen-gers.
	<i>Tons.</i>	<i>Tons.</i>	<i>Number.</i>
1.....	331	585,409	1,696
2.....	38	1,915,436	232
3.....	22	82,912	2,547
Aggregate.....	391	2,583,757	4,475

F F 7.

### IMPROVEMENT OF OHIO RIVER, PENNSYLVANIA.

*Lock and Dam No. 2.*—This work was in local charge of Mr. J. W. Arras, assistant engineer, during the fiscal year.

The principal operations under way on this structure at the beginning of the fiscal year were the alterations necessary to the lock and 500 feet of navigable pass to effect a 9-foot navigation in Pool No. 2,



Mr. E. Brown Baker, contractor for completion of dam, namely, 200 feet of navigable pass, 176 feet of Chanoine wicket weir, and a bear-trap 102 feet 4 inches wide, having practically completed his work, including the necessary alterations from a 6 to a 9 foot depth of pool. On the alterations to lock and 500 feet of Chanoine dam most of the 30-inch stone coping and 6-inch timber facing of lock walls had been removed, cofferdams constructed across lock, and lock chamber unwatered; all of the wickets, horses, and props removed from 500 feet of dam, nearly all of the horses and props lengthened, and new wickets constructed. Also considerable material for raising and facing lock walls and the lock-operating machinery and devices had been let under contract and partly delivered. Operations were also under way on reconstruction of cut-off dam between Davis and Neville Islands at the head of Pool No. 2.

During the season of 1906 the water conditions were comparatively favorable for the prosecution of this work, permitting of its completion to such extent as to place the lock and dam in commission on October 13, except that the permanent power plant had not been installed, necessitating the temporary use of construction steam plant for operating the lock.

Quantities of material placed and work done under this contract during the fiscal year, and the cost thereof per unit, were as follows:

Items.	Designation.	Quantities.	Price per unit.
Cast iron .....	Pounds .....	4,214	\$0.06
Medium steel .....	do .....	150	.06
Bolts and washers .....	do .....	131	.04
Concrete .....	Cubic yards .....	63	7.25
Riprap .....	do .....	157	3.50

The remainder of the 30-inch coping and timber facing of the lock walls was removed; a construction plant installed; both lock walls faced with concrete 20 inches in thickness and reinforced with steel; a concrete coping 3½ feet in thickness placed on the river wall and a similar coping 5 feet in thickness on the land wall; concrete foundations and walls constructed for lock-gate engines; walls of pump well raised with concrete to elevation of land wall of lock; both lock-gate tracks taken up and relaid to proper gauge and alignment; all deposits of silt, gravel, and bowlders removed from lock-gate recesses, flushing conduits, and lock chamber, and shale lock floor reduced to an elevation of 6 inches below level of lower miter sill; concrete foundations for gas engines and air compressors constructed in power house; deposits removed from power conduit connecting power house with river wall of lock; stone masonry of ends of lock walls trimmed and repointed, and stone pierhead on upper end of river wall reset. All deposits and material were removed from lock chamber, recesses and conduits were placed on esplanade, and basement of power house about machinery foundations filled with gravel to level of floor. Approximately, 3,362 cubic yards of concrete were placed and 3,675 cubic yards of excavation made.

The steel lock gates, similar to those in use at Lock No. 6, Ohio River, under a contract with the Penn Bridge Company, for which materials were being delivered at the beginning of the fiscal year, were completed in October.

Of the lock-operating machinery there were installed, prior to placing the lock in commission, 32 individual valve-operating jacks, one at each of the filling and emptying valves of the lock, and all of the pipe-line connections between the jacks and the power house, through the power conduit underneath the floor of the lock; and the lock-gate operating gearing and gate engines, and pumps for operating valve jacks and supplying water for gas-engine-compressor plant and other uses, were installed. The valve-operating jacks were designed for the use of either oil, water, or air. A gravity water-supply line was laid from upper lock-gate recess to pump well, and air or steam line connections made between power plant and lock-gate engines.

For the 500 linear feet of navigable pass, undergoing alterations to meet the requirements of a 9-foot navigation, all of the horses, props, and wickets were placed, the work being performed under the supervision of the regular force at Davis Island dam. A steel service bridge, constructed by Lawrence D. Weaning, of Cleveland, Ohio, was erected on its foundation above the Chanoine-wicket weir, and the necessary chain attachments made, all at a cost of \$2,721.68.

A maneuvering boat for operating the dam, the hull for which had been previously constructed, was equipped with the necessary machinery, furnished under contract by Thomas Carlin's Sons Company, of Allegheny, Pa., the installation of the machinery and erection of cabin being performed at Davis Island dam by the regular operating force at that place.

The concrete cut-off dam between Davis and Neville islands, at the head of Pool No. 2, was completed in September, except the placing of 568 cubic yards of riprap stone for protection of the Davis Island end of dam, which was performed in November. The total length of concrete structure is 700 feet, and its height the theoretical level of Pool No. 2. Its design is similar to the general type of fixed concrete dams in this district. The concrete construction was erected on the remains of a timber cribwork dam built at that location in 1889. The structure was well protected with riprap stone along both edges and at its connections with the islands. The quantity of concrete entering into its reconstruction was approximately 2,175 cubic yards and the excavation 1,935 cubic yards.

During the fall of 1906 Mr. E. Brown Baker, contractor for completing Dam No. 2, installed the bear-trap operating gearing, procured stone for the remainder of the stone protection at lower edge of dam, and removed a little of the cofferdam inclosing 200 feet of navigable pass. However, owing to the subsequent unsatisfactory progress of his work, he was notified, on November 17, of the purpose of the United States to utilize the contractor's plant, employ labor, and take the necessary steps to put the work in a proper state of advancement. In pursuance of this notification a dredge was employed to remove the remainder of the gravel cofferdam. The dredge commenced operations on November 26 and completed its work in the early part of December, having removed about 4,000 cubic yards of material. Later, the contractor, having materials and plant at hand, was permitted to complete the stone protection along downstream edge of dam, the work being finished about March 1, 1907.

During the winter the I-beams and steel plates for lock-gate recess covers were placed and a contract let to the Penn Bridge Company, of Beaver Falls, Pa., for furnishing cover plates for the lock. At

the end of the year the shop work on the latter was practically completed. Also in the early spring of 1907 the permanent power plant, consisting of two 85-brake horsepower gas engines, furnished under a contract with the Westinghouse Machine Company, of Pittsburg, Pa., and two 2-stage air compressors of 500 cubic feet free air per minute capacity each, under a contract with the Blaisdell Machinery Company, of Bradford, Pa., were installed. Under a very thorough test the machinery was generally satisfactory, except as to facilities for providing starting air and a slight defect in the chain-drive connection between engines and compressors, proposed improvements of which are now under way by contractors. A brick floor was laid in power house, but, owing to settlement during the freshet of March 15, was taken up and relaid immediately thereafter, and storage tanks erected in power house for supplying water for machinery-cooling purposes and other uses about the plant.

*Lock and Dam No. 3.*—This work was in local charge of Lieut. George R. Spalding, Corps of Engineers, from July 1, 1906, to October 31, 1906, and of Capt. F. W. Altstaetter, Corps of Engineers, from November 1, 1906, to June 30, 1907.

Operations were continued by the Ohio River Contract Company under its contract for building 100 linear feet of navigable pass, etc. Excavation was made for 50 linear feet of the pass and round piling was driven in 100 feet of the pass. A crib was built and sunk in the pass and bear-trap weir No. 2. A crib 100 feet long was also built and sunk along the face of the abutment. Sheet piling was driven in one-fourth of bear-trap weir No. 1, in all of bear-trap weir No. 2, all in Chanoine weir, except 36 feet, and all around heads and tails of piers Nos. 1, 2, and 3, and in 100 feet of navigable pass. Masonry was completed in 100 feet of navigable pass, piers Nos. 1, 2, and 3, bear-trap weirs Nos. 1 and 2, except about 126 yards around bear-trap hinges in weirs Nos. 1 and 2, and 108 feet of Chanoine weir. The movable parts were placed in 100 linear feet of navigable pass and 144 linear feet of Chanoine weir. The actual quantities of materials furnished and placed or work done under this contract were as follows:

Item.	Designation.	Quantities.	Price per unit.
Excavation.....	Cubic yards.....	12, 150	\$0.80
Hemlock timber.....	Feet B. M.....	55, 566	50.00
Oak timber.....	do.....	76, 605	80.00
Wrought iron and steel.....	Pounds.....	383, 661	.06
Cast iron.....	do.....	159, 017	.06
1-inch galvanized-iron pipe.....	Linear foot.....	544	1.00
3-inch galvanized-iron pipe.....	do.....	1, 064	.90
Black pipe, 2 inches diameter.....	do.....	220	.50
Bronze.....	Pounds.....	149	.50
Round piling.....	Linear foot.....	3, 326	.68
Sheet piling.....	Feet B. M.....	44, 719	90.00
Concrete.....	Cubic yards.....	8, 101	8.50
Stone filling, crib.....	do.....	1, 795	3.00
Large stone.....	do.....	958	3.00
Common filling.....	do.....	505	8.75
Crib decking.....	Feet B. M.....	39, 600	60.00

The bear-trap gates, for which contract was also entered into with the Ohio River Contract Company, were partly erected, the following quantities of materials being furnished and placed or work done, in addition to materials delivered for erection: Lower leaf of one bear

trap was erected and partly riveted; five girders with lower-skin plating and 265 rivets were placed in lower leaf of the other bear trap.

The erection of two steel lock gates, under contract with Lawrence D. Weaning, of Cleveland, Ohio, was practically completed.

The J. & J. B. Milholland Company, of Pittsburg, Pa., furnished and delivered, under contract, 32 valve jacks, at a cost of \$2,851, the jacks being installed by the United States. The same company also furnished, under contract, the lock-gate operating machinery at a cost of \$2,281. This machinery was also installed by the United States.

The United States also installed the two lock-gate engines, which were furnished, under contract, by the Robinson Machine Company, of Pittsburg, Pa. The contract price for the engines was \$1,260.

The Westinghouse Machine Company, of Pittsburg, Pa., practically completed the installation of the two 85-brake horsepower engines, furnished under contract. The two air compressors, for which contract was entered into with the Blaisdell Machinery Company, of Bradford, Pa., were delivered and installed, the work being practically completed.

Joseph Moscarelli, of Beaver Falls, Pa., under his contract, completed the erection of two lock houses, the price paid therefor being \$10,719.18.

The contract with N. D. Yant & Co., of Allegheny, Pa., for 27 Poiree trestles, was completed by that company in October, 1906, at a total cost of \$2,209.80. The same company also completed, in October, 1906, at a cost of \$2,726.77, its contract for a structural steel service bridge, for use in connection with the Chanoine weir.

The 120 steel plates and 38 steel I-beams, which were installed by the United States over the gate recesses, were delivered, under contract, by the Penn Bridge Company, of Beaver Falls, Pa. The contract price for same was \$3,066.89.

The lower guide wall was raised 4 feet, 419.5 cubic yards of concrete being used in connection with this work, which was done by the Bishop Construction Company, of Sewickley, Pa. The total cost of this work was \$2,470.86.

A contract was entered into with the Ohio River Contract Company for excavating in and paving the lock chamber. The excavation was about completed at the end of the year.

The following work was done by hired labor: A maneuvering boat, for operating the dam, was completed, including the installation of the machinery. The lock-gate engine pits were constructed; 136 cubic yards of concrete were used in this work. The land wall of lock was raised 30 inches above its original elevation, 273 cubic yards of stone masonry being used to do this work. The gearing, etc., connecting the gate engines to the drum shafts were placed in the machinery pits. The pipe lines leading from the power house to the valve jacks on the river wall were laid and connected up; also the pipe lines leading from the power house to the lock-gate engine pits were put in place and proper connections made to engines. Concrete foundations (77 cubic yards) were built in power house for the gas engines and air compressors. The gas and water lines from the power house to the lock houses were laid and proper connections made

thereto. The upper and lower gate recesses were unwatered, débris removed therefrom, and the recesses kept unwatered during erection of the lock gates. The pipe conduit under the lock was also unwatered, débris removed from same, and water and air lines laid therein. In the first 400 feet of navigable pass there were placed 18 wickets and 33 props. Seventy-two horse boxes were removed from this part of the pass and 70 new ones placed. The service bridge at the Chanoine weir was erected. Cover plates were placed over both gate recesses. The Pennsylvania Railroad Company placed about 15,000 cubic yards of material in the esplanade area.

*Lock and Dam No. 4.*—This work was in local charge of Lieut. E. N. Johnston, Corps of Engineers, during the fiscal year.

Under the contract with Baker & Egan, of Pittsburg, Pa., for building 352 feet of Chanoine dam, of which the United States had assumed charge upon the failure of the contractor to properly prosecute the work, 174 feet of the dam, including the movable parts, were completed and the cofferdam removed from around same.

Baker & Egan, assisted by the United States, as hereinafter noted, built a cofferdam around the uncompleted portion of navigable pass (178 feet), drove the balance of the round piles, about one-third of the sheet piles, and completed the protection crib within three courses of the top and placed about one-half of the stone filling therein. Forms had already been built preparatory to concreting the foundation when the high water of November 20–22, 1906, flooded the cofferdam, and, although it was afterwards repaired, no further construction work was done last fall, nor has anything been done this spring owing to unusually frequent freshets. The materials placed and excavation done under this contract, and the prices paid therefor, during the fiscal year were as follows:

Item.	Designation.	Quantities.	Price per unit.
Hemlock lumber.....	Feet B. M.....	55,634	\$50.00
Sheet piling.....	do.....	5,418	90.00
Stone filling below dam.....	Cubic yards.....	339	3.00
Stone filling (crib).....	do.....	875	3.00
Common filling.....	do.....	147	.60
Excavation.....	do.....	1,866	.80
Concrete.....	do.....	1,342	6.00
Cast iron.....	Pounds.....	41,787	.05
Driftbolts.....	do.....	9,603	.05
Bolts and washers.....	do.....	11,292	.05

Under contract with the Baker Contract Company, the following was done, namely, the three piers and the Chanoine weir, including movable parts and protection crib, were completed; 90 per cent of the abutment was finished, as was also the protection crib along the lower wing of same; the foundation of bear trap No. 1 was finished, and about one-half of the lower leaf of the first bear trap was erected preparatory to riveting; the foundation course of concrete in bear trap No. 2 was placed and the foundation irons set.

Owing to the failure of Baker & Egan and the Baker Contract Company, the United States assumed charge of the entire work from November 13, 1906, to December 11, 1906, when the work was placed in charge of the Colonial Trust Company, receiver for the aforesaid firms.

The materials placed and excavation done under the Baker Contract Company's contract, and the prices paid therefor, during the fiscal year were as follows:

Item.	Designation.	Quantities.	Price per unit.
Hemlock timber .....	Feet B. M .....	131,686	\$55.00
Crib decking .....	.....do .....	84,085	60.00
Sheet piling .....	.....do .....	70,891	90.00
Round piling .....	Linear feet .....	16,606	.65
Stone crib filling .....	Cubic yards .....	2,600	3.00
Excavation .....	.....do .....	18,111	.80
Concrete .....	.....do .....	8,729	8.00
Wrought iron and steel .....	Pounds.....	823,880	.07
Cast iron .....	.....do .....	159,204	.06

No work has yet been done on this contract this season, except to repair the cofferdam around the bear traps, but it is expected that satisfactory progress will be made as soon as the river conditions permit.

The following work was done by hired labor: Completed 174 feet of navigable pass, including movable parts, excavating therefor 1,500 cubic yards of material; placed the movable parts in two-thirds of the 250-foot completed section of Chanoine dam; installed the necessary piping, etc., in the power house for operation of lock gates, bear traps and jacks for operation of valves; removed the accumulation of dirt and drift from the gate recesses; placed the cover plates over the gate recesses and painted same; set the gate and valve-operating machinery for operation of upper lock gate; raised the upper gate-engine pit and section of land wall adjoining; reset the pierheads of the river wall, which were in bad condition because of open joints; 32 valve jacks for operating butterfly valves were set on the river wall, 10 cubic yards of concrete being used in this work, practically all the necessary piping pertaining thereto was also set; repaired the front porch of upper lock house and made necessary repairs to plant, damage to which was caused by the extraordinarily high flood of March 15, 1907; the stone coping was removed from the land wall preparatory to raising the same, and the timber facing of the land wall was removed preparatory to facing the same with concrete. Water conduits for operating lock machinery were placed, 150 linear feet of galvanized-iron pipe, 1,275 linear feet of 3-inch pipe, 920 linear feet of 2-inch pipe, and 25 feet of 1½-inch pipe being used; for telephone and electric wire conduits 280 linear feet of 3-inch pipe were used; water lines were laid from power house to lock houses, 220 linear feet of 3-inch and 90 linear feet of 2-inch pipe being used; 3 water tanks were installed: in connection with work of covering lock-gate recesses, 38 steel I beams, 27 feet long, approximating 43,092 pounds, were placed; the wrought-iron cover plates for gate recesses approximated 128,160 pounds; 60 cubic yards of concrete were used in raising upper lock-gate engine pit. The pierheads on river wall were rebuilt: an engine, boiler, and steam capstan were installed on the maneuvering boat; 800 cubic yards of riprap were placed as protection to river wall.

*Lock and Dam No. 5.*—This work was in local charge of Mr. A. B. McGrew, assistant engineer, during the fiscal year.

The year was an unfavorable one for the work on the dam, owing to the large number of rises, which caused delays on all contract and hired-labor work. These rises included the great flood of March 15, 1907, which reached the maximum height of 45.2 feet, within 0.1 of a foot of the highest known water, namely, 45.3 feet on February 7, 1884.

Under the contract with the Dravo Contracting Company, the navigable pass, Chanoine weir, and one pier were completed, the following being a statement of the materials placed and work done under this contract and the cost thereof in unit quantities:

Item.	Designation.	Quantities.	Price per unit.
Excavation.....	Cubic yards.....	2,892	\$0.70
Hemlock timber.....	Feet B. M.....	128,348	50.08
Oak timber.....	do.....	78,969	90.00
Crib decking.....	do.....	97,800	55.00
Cast iron.....	Pounds.....	148,983	.05
Wrought iron and steel.....	do.....	404,544	.07
Bronze.....	do.....	68	.40
Concrete.....	Cubic yards.....	4,590	7.50
Stone filling.....	Tons.....	5,442	2.25
Riprap stone.....	do.....	1,820	2.25
Common filling.....	Cubic yards.....	1,086	.50
3-inch galvanized-iron pipe.....	Linear feet.....	767	1.00
4-inch galvanized-iron pipe.....	do.....	303	1.25
2-inch black iron pipe.....	do.....	167	.40
Brick paving.....	Square yards.....		1.50
Sheet piling.....	Feet B. M.....	37,060	95.00
Piling, round or bearing.....	Linear feet.....	9,917	.60

Under contract with the same company, one bear-trap gate was completed. The following is a statement of the materials placed and work done under this contract for one gate and the cost thereof in unit quantities:

Item.	Designation.	Quantities.	Price per unit.
Oak timber.....	Feet B. M.....	22,389	\$100.00
Bronze.....	Pounds.....	1,224	.60
Cast iron.....	do.....	8,723	.07
Wrought iron, bolts, spikes, etc.....	do.....	3,527	.06
Steel castings.....	do.....	39,479	.10
Wrought steel.....	do.....	296,100	.0825

The Penn Bridge Company, under contract, completed the erection in place of two steel lock gates, the actual quantities of materials placed and the cost thereof in unit quantities being as follows:

Item.	Designation.	Quantities.	Price per unit.
Timber.....	Feet B. M.....	16,431	\$59.00
Bronze.....	Pounds.....	3,630	.33
Cast iron.....	do.....	59,685	.06
Steel castings.....	do.....	14,352	.09
Wrought steel.....	do.....	496,529	.067

The machinery for the lock gates was installed, wickets for the pass completed, and 116 wickets placed in the navigable pass. The remaining 59 wickets were completed.

Due to the change of the project from 6 to 9 feet, the following work was done:

The land wall was raised 30 inches by means of coping stone received from Dam No. 2, 357 cubic yards of stone being used in this work. One hundred and sixty-one cubic yards of concrete were used in raising lock-gate recesses.

The work of dredging a channel 250 feet wide at the lower approach to the lock was in progress during the year and about completed. About 48,800 cubic yards of material were removed.

To secure the foundation of the lower guide wall, 20,748 feet B. M. of sheet piles were driven along the outside of the wall for a distance of 247 feet and 62 cubic yards of concrete placed under the toe of the wall for a distance of 150 feet. Seventy-three cubic yards of concrete were used in building floors of power house and raising piers for engine foundations. In changing gate-recess foundations 60 cubic yards of concrete were placed. One thousand five hundred and sixty tons of slag were placed as protection to power-house foundation and recess walls.

*Lock and Dam No. 6.*—The alteration of this work, to provide 9-foot navigation, was in local charge of Mr. A. B. McGrew, assistant engineer, during the fiscal year.

The plant for lowering the lower sill was being assembled and the construction of the cofferdam for unwatering the lock was in progress at the close of the fiscal year. A contract for removing the lower gate and building a higher one in its place was awarded to the Penn Bridge Company.

*Lock and Dam No. 7.*—This work was in local charge of Mr. A. B. McGrew, assistant engineer, during the fiscal year.

Some work was accomplished in the preparation of plans for the lock and dam, but as no further appropriation was made by Congress for this work at its last session the preparation of plans has been discontinued.

*Harbor lines, Ohio River, Pennsylvania.*—The establishment of harbor lines on the Ohio River from Dam No. 3, at Glenosborne, to Dam No. 4, near Baden, having been authorized April 26, 1906, a party of 8 men with the small steamboat *Loma*, with a crew of 6 men, started work June 22, 1906, at Dam No. 4. This party was in the field until September 18, 1906.

The methods and character of work were the same as on the Allegheny River, Pittsburg to Natrona, and described elsewhere in report for that work. The length of river channel surveyed was 8 miles. The number of triangles measured was 76; they were marked by 77 stations and plates and checked by 3 base lines. Connection was made with a number of stations of the 1896 survey. The triangulation was extended to Aliquippa, about  $1\frac{1}{2}$  miles below Dam No. 4, to get a good connection with harbor-line locations in Pool No. 5, made under direction of Col. G. J. Lydecker, Corps of Engineers.

Tentative locations of harbor lines on both banks were laid down on the maps, and that on left bank, from Shannopin to Dam No. 4, 4 miles, was marked on the ground.

A public hearing for consideration of the proposed lines in the reach, Shannopin to Dam No. 4, was held November 28. After some revision of these lines their final locations were determined upon and the coordinates were computed.

On the part from Shannopin to Dam No. 3 only tentative locations of harbor lines were laid down on the field sheet. Two sets of



maps of the whole reach were made on tracing linen in seven sheets, each 30 by 58 inches, scale 1 inch = 120 feet.

*Dimensions and other data of locks and dams, Ohio River, Pennsylvania.*

Location.	Reference number.	Locks.						
		Distance from Pittsburgh.	Height of pool above sea level.	Underlying material.	When commenced.	When completed.	Quantity of masonry.	Extreme length.
West Bellevue, Pa., Davis Island dam.	1	5.5	<i>Feet.</i> 703.0	L. W. rock, R. W. gravel.	1878	1885	<i>Cu. yds.</i> 30,000	<i>Feet.</i> 689
1 mile above Coraopolis, Pa.	2	9	699.875	Rock .....	1898	1906	26,000	689
Osborn, Pa. ....	3	11	692.134	Gravel .....	1899	Not completed.	35,877	689
Legionville, Pa.	4	18	684.393	.....do .....	1898	.....do .....	35,582	689
Below Freedom, Pa.	5	23.9	676.752	.....do .....	1898	.....do .....	34,800	684
Merrill, Pa. ....	6	28.8	668.264	Rock and gravel..	1892	1904	30,520	693
	7	36.41	662.6	Rock .....	Not commenced.			

Location.	Locks.									
	Clear width.		Depth on upper miter sill.	Depth on lower miter sill.	Guard.	Material.	River wall.			
	Feet.	Feet.					Height above lower miter sill.	Height above floor.	Height above foundation.	Top width.
West Bellevue, Pa., Davis Island dam.	110	3.125	11.965	9.59	5'0	Stone and concrete.	17.815	18.315	32	14.0
1 mile above Coraopolis, Pa.	110	7.741	16.741	9.5	Land wall 5', river wall 3'.	Stone, concrete, and timber.	20.241	20.741	22	14.5
Osborn, Pa. ....	110	7.741	16.741	9.5	Land wall 4'5, river wall 2'.	.....do .....	19.241	19.741	32	14.5
Legionville, Pa.	110	7.641	16.641	9.5	.....do .....	.....do .....	19.141	19.641	32	14.5
Below Freedom, Pa.	110	8.488	14.488	9.0	.....do .....	.....do .....	19.488	19.988	30	14.5
Merrill, Pa. ....	110	5.664	13.156	11.0	5'0	.....do .....	21.656	22.656	32	14

Location.	Locks.									
	Land wall.				Guide walls.		Material of floor.	Gates.		
	Height above lower miter sill.	Height above foundation.	Bottom width.	Top width.	Length of upper wall.	Length of lower wall.		Material.	Kind.	How operated.
West Bellevue, Pa., Davis Island dam.	<i>Feet.</i> 17.815	<i>Feet.</i> 25	<i>Feet.</i> 8	<i>Feet.</i> 3	<i>Feet.</i> 605	<i>Feet.</i> 255	Gravel..	Steel and timber.	Rolling.	Steam.
1 mile above Coraopolis, Pa.	22.241	23.5	11	5	625	625	Rock ..	.....do .....	.....do .....	Air.
Osborn, Pa. ....	21.741	34.5	11	5	720	620	Riprap ..	.....do .....	.....do .....	Do.
Legionville, Pa.	21.641	34.5	11	5	701	625	.....do ..	.....do .....	.....do .....	Do.
Below Freedom, Pa.	21.988	32.5	11	5	625	625	.....do ..	.....do .....	.....do .....	Do.
Merrill, Pa. ....	21.656	32	10	5	727.5	625	Gravel..	.....do .....	.....do .....	Do.

## Dimensions and other data of locks and dams, Ohio River, Pennsylvania—Cont'd.

Location.	How filled and emptied.	Number and location of filling valves.	Number and location of emptying valves.	Locks.			
				Area of filling valves.	Area of emptying valves.	Type of filling valves.	Type of emptying valves.
West Bellevue, Pa., Davis Island dam.	Through valves in walls and gates.	7 in river wall, 7 in land wall, 14 in upper gate.	7 in land wall, 14 in lower gate.	Sq. ft. 409	Sq. ft. 816	Butterfly.	Butterfly.
1 mile above Coraopolis, Pa.	do	16 in river wall, 18 in upper gate.	16 in river wall, 18 in lower gate.	485	485	do	Do.
Osborn, Pa.	do	do	do	485	485	do	Do.
Legionville, Pa.	do	do	do	485	485	do	Do.
Below Freedom, Pa.	do	do	do	485	485	do	Do.
Merrill, Pa.	do	do	do	485	485	do	Do.

## Dams.

Location.	Type (movable or fixed).	Underlying material.	Material of dam.	Length from lock to abutment.	Base width.	Width of apron.
				Feet.		Feet.
West Bellevue, Pa., Davis Island dam.	Movable.	Gravel.	Timber, concrete, and iron.	1,223	Pass, 43'-9" Weir 1, 44'-9" B. T., 60'-2" Weir 2, 44'-9" Weir 3, 44'-9" 500' P., 29'-10" 200' P., 34'	30 16
1 mile above Coraopolis, Pa.	do	Pass and B. T. rock-weir gravel.	Timber, concrete, and steel.	1,002 4	B. T., 72'-6" Weir, 40' P., 100'-35" P., 800'-32" Weir, 40' B. T., 87'-10" P., 450'-35"	15 15 20
Osborn, Pa.	do	Gravel.	do	1,068	B. T., 87'-10" Weir, 40' P., 250'-30" P., 450'-35"	20 50 20
Legionville, Pa.	do	do	do	1,108	B. T., 87'-10" Weir, 40' 337' P., 36" 308' P., 32"	20 50 20
Below Freedom, Pa.	do	do	do	1,020	B. T., 87'-10" Weir, 39' P., 29'-11"	20 50
Merrill, Pa.	do	do	do	1,000	Weirs, 53'-11 1/4"	50

## Dams.

## Weirs.

Location.	Number and dimensions.	Closure (wickets, needles).	Level of sill to lower pool.	Worked from bridge or boat.	Length of wicket.	Thickness of wicket.
			Feet.			In.
West Bellevue, Pa., Davis Island dam.	B. T., 52' Weir 2, 212' Weir 3, 216'	B. T. gates Wickets do	B. T., 6.07 Weir 2, 7. Weir 3, 6.	Valves in piers. Bridge.	Weir 2, 10'-10 1/4" Weir 3, 9'-9 1/4"	8 7 1/2
1 mile above Coraopolis, Pa.	B. T., 102'-4" Weir, 176'	B. T. gates Wickets	B. T., 6.926 Weir, 5.926	Valves in piers. Bridge.	14'-8 1/4"	10
Osborn, Pa.	2 B. T., 93' Weir, 144'	B. T. gates Wickets	B. T., 5.747 Weir, 4.428	Valves in piers. Bridge.	13'-1 1/4"	10
Legionville, Pa.	2 B. T., 93' Weir, 184'	B. T. gates Wickets	B. T., 5.847 Weir, 4.859	Valves in piers. Bridge.	12'-10 1/4"	10
Below Freedom, Pa.	2 B. T., 93' Weir, 96'	B. T. gates Wickets	B. T., 5. Weir, 3.	Valves in piers. Bridge.	12'-4 1/4"	10
Merrill, Pa.	2 B. T., 120' A, frame, 120'	B. T. gates A, frames	7.5.	Valves in piers. Crab.		

*Dimensions and other data of locks and dams, Ohio River, Pennsylvania—Cont'd.*

Location.	Dams.						Abutment.	
	Pass.						Type.	Founda- tion.
	Dimen- sions.	Closure.	Level of sill to lower pool	Worked from—	Length of wicket.	Thickness of wicket.		
	<i>Feet.</i>		<i>Feet.</i>			<i>In.</i>		
West Bellevue, Pa., Davis Island dam, 1 mile above Coraopolis, Pa.	P. 559 ..... Weir 1, 160	Wickets ..	{ P. 9 ..... Weir 1, 8	Boat..	{ P. 12'-11 1/2" Weir 1, 11'-11 1/2" 17'-10 1/2"	9 8 1/2 12	Stone .....	Gravel.
Osborn, Pa. ....	700 .....do ..	9	do ..	do ..	17'-10 1/2"	12	Concrete on timbercrib.	Do.
Legionville, Pa.	700 .....do ..	9	do ..	do ..	17'-9 1/2"	12	Concrete on piles.	Do.
Below Free- dom, Pa.	700 .....do ..	6	do ..	do ..	16'-7 1/2"	10	do .....	Do.
Merrill, Pa. ....	600 .....do ..	7.5	do ..	do ..	14'-1 "	10	Stone and concrete.	Do.

*Money statement.*

[For detailed money statements see page 552.]

July 1, 1906, balance unexpended.....	\$1, 486, 454. 58
Amount received from sale of blueprints.....	77. 61
Amount appropriated by river and harbor act approved March 2, 1907.....	70, 000. 00
Amount received from sale of land and condemned property.....	14, 911. 23
	<u>1, 571, 443. 42</u>
June 30, 1907, amount expended during fiscal year:	
For works of improvement.....	\$1, 037, 817. 78
By transfer settlement.....	350. 00
	<u>1, 038, 167. 78</u>
July 1, 1907, balance unexpended.....	533, 275. 64
July 1, 1907, outstanding liabilities.....	21, 533. 92
	<u>511, 741. 72</u>
July 1, 1907, amount covered by uncompleted contracts.....	382, 877. 18
Amount (estimated) required for completion of existing project..	952, 000. 00
	<u>300, 000. 00</u>
{ Amount that can be profitably expended in fiscal year ending June 30, 1909, for works of improvement (Lock and Dam 7), in ad- dition to the balance unexpended July 1, 1907.....	300, 000. 00
{ Submitted in compliance with requirements of sundry civil act of June 4, 1897.	

## APPROPRIATIONS.

September 19, 1890, construction of Lock and Dam No. 6.....	\$250, 000. 00
July 13, 1892, construction of Lock and Dam No. 6, and purchase of land for No. 2.....	100, 000. 00
August 18, 1894, construction of Lock and Dam, No. 6.....	75, 000. 00
March 2, 1895, construction of Lock and Dam No. 6.....	150, 000. 00
June 3, 1896:	
Construction of Lock and Dam No. 6.....	25, 000. 00
Construction of Locks and Dams Nos. 2, 3, 4, and 5, and pur- chase of sites for Nos. 3, 4, and 5.....	30, 000. 00
June 4, 1897:	
Construction of Dams Nos. 2, 3, and 4.....	400, 000. 00
Construction of Dam No. 6.....	300, 000. 00

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July 1, 1898, continuing construction of Dams Nos. 2, 3, 4, and 5..	\$595,000.00
March 3, 1899, continuing construction of Dams Nos. 2, 3, 4, and 5..	400,000.00
June 6, 1900, continuing construction of Dams Nos. 2, 3, 4, and 5..	595,000.00
June 13, 1902:	
Continuing construction of Locks and Dams Nos. 2, 3, 4, and 5..	100,000.00
Completing Lock and Dam No. 6.....	175,000.00
Construction of Lock and Dam No. 7.....	23,000.00
March 3, 1903, continuing construction of Dams Nos. 2, 3, 4, and 5..	300,000.00
March 3, 1905, completion of Locks and Dams Nos. 2, 3, 4, and 5, and the modification of said locks and dams and of Lock and Dam No. 6 so as to secure a stage of 9 feet in the pools belonging thereto.....	500,000.00
June 30, 1906, for continuing improvement by the completion of Locks and Dams Nos. 2, 3, 4, and 5. and the modification of said locks and dams and of Lock and Dam No. 6 so as to secure a stage of 9 feet in the pools belonging thereto.....	1,281,376.00
March 2, 1907, lowering of sill of Lock No. 6.....	70,000.00
Received from other sources.....	15,233.54
Total.....	5,384,009.54

## CONTRACTS IN FORCE.

BUILDING 376 FEET OF CHANOINE DAM AND A BEAR-TRAP DAM 102 FEET 4 INCHES WIDE, DAM NO. 2, OHIO RIVER.

Contractor: E. Brown Baker, Pittsburg, Pa.

Rates, original contract: Excavation, 90 cents per cubic yard; hemlock timber, \$60 per M feet B. M.; oak timber, \$65 per M feet B. M.; white-pine timber, \$60 per M feet B. M.; cast iron, 5 cents per pound; medium steel, 6 cents per pound; bolts and washers, 4 cents per pound; concrete, \$7.25 per cubic yard; reinforcing steel, 3 cents per pound; stone filling (crib), \$3 per cubic yard; riprap stone, \$3.50 per cubic yard; common filling, 40 cents per cubic yard; drift-bolts, 4 cents per pound; 34-inch galvanized-iron pipe, 50 cents per linear foot; 4-inch galvanized-iron pipe, 60 cents per linear foot; brick paving, \$4 per square yard; block stone paving, \$4 per square yard; sheet piling, \$70 per M feet B. M.

Rates, supplemental contract: For making certain changes in location of hurters and in dimensions of horses and props in a portion of Dam No. 2, made necessary by change of project from a 6-foot to a 9-foot stage: For setting 50 hurters in pass, lump sum, \$650; for removing horse boxes, making certain alterations, and replacing same in work, lump sum, \$400; for furnishing and placing horses, props, wickets, and quoins in pass and weir, iron and steel in horses, props, and wickets, 7 cents per pound; cast iron in quoins, 6 cents per pound; white-oak timber, \$90 per M feet B. M.

Rates, additional supplemental contract: Provides for building foundation for service bridge and needle weir: Unit prices same as in original contract; round piles not mentioned in original contract, 65 cents per linear foot.

Additional supplemental contract providing for change in method of payment.

Dates of approval: Original contract, February 13, 1904; supplemental contract, June 7, 1905; additional supplemental contract, October 5, 1905; additional supplemental contract, January 29, 1906.

Date of beginning work: April 17, 1904.

Date of expiration: April 17, 1906 (extended for a reasonable period).

## FURNISHING AND DELIVERING 38 STEEL I-BEAMS AT DAM NO. 2, OHIO RIVER.

Contractor: Penn Bridge Company, Beaver Falls, Pa.

Rate: 1.97 cents per pound.

Date of approval: <sup>a</sup>

Date of beginning work: April 29, 1906.

Date of expiration: July 23, 1906.

<sup>a</sup> Emergency.

## FURNISHING AND DELIVERING SAND AND GRAVEL AT DAVIS ISLAND DAM, OHIO RIVER.

Contractor: J. K. Davison & Bro., Pittsburg, Pa.  
Rates: Sand, 2 cents per bushel; gravel, 1 cent per bushel.  
Date of approval: <sup>a</sup>  
Date of beginning work: May 23, 1906.  
Date of expiration: September 30, 1906.

## FURNISHING GRAVEL AND SAND AT LOCK NO. 2, OHIO RIVER, NEAR GLENFIELD, PA.

Contractor: J. K. Davison & Bro., Pittsburg, Pa.  
Rates: Gravel,  $1\frac{1}{4}$  cents per bushel; sand,  $2\frac{1}{4}$  cents per bushel.  
Date of approval: <sup>a</sup>  
Date of beginning work: June 1, 1906.  
Date of expiration: July 30, 1906.

## FURNISHING AND DELIVERING 2,000 BARRELS OF CEMENT (4 SACKS TO CONSTITUTE A BARREL) AT DAM NO. 2, OHIO RIVER.

Contractor: Alpha Portland Cement Company, Pittsburg, Pa.  
Rate: \$1.83 per barrel, less  $7\frac{1}{4}$  cents each for return of empty sacks.  
Date of approval: <sup>a</sup>  
Date of beginning work: June 15, 1906.  
Date of expiration: August 14, 1906 (extended for a reasonable period).

## FURNISHING AND DELIVERING 2,700 BARRELS OF CEMENT (4 SACKS TO CONSTITUTE A BARREL) AT BELLEVUE, PA.

Contractor: Alpha Portland Cement Company, Pittsburg, Pa.  
Rate:  $45\frac{1}{4}$  cents per sack, less  $7\frac{1}{4}$  cents each for return of empty sacks.  
Date of approval: <sup>a</sup>  
Date of beginning work: June 15, 1906.  
Date of expiration: September 15, 1906.

## FURNISHING AND DELIVERING F. O. B. CARS ON GRAHAM'S SWITCH, NEVILLE ISLAND, P. C. AND Y. RAILROAD, 10 HORSE BOXES, 8 HORSES, AND 12 PROPS, FOR DAM NO. 2, OHIO RIVER.

Contractor: Penn Bridge Company, Beaver Falls, Pa.  
Rates: Cast iron,  $5\frac{1}{2}$  cents per pound; wrought iron or steel,  $6\frac{1}{2}$  cents per pound.  
Date of approval: <sup>a</sup>  
Date of beginning work: January 1, 1907.  
Date of expiration: March 17, 1907 (extended for a reasonable period).

## FURNISHING AND DELIVERING F. O. B. CARS ON GRAHAM'S SWITCH, NEVILLE ISLAND, P. C. AND Y. RAILROAD, COVER PLATES AND I BEAMS, FOR DAM NO. 2, OHIO RIVER.

Contractor: Penn Bridge Company, Beaver Falls, Pa.  
Rates: Steel castings, 20 cents per pound; wrought steel, 4.45 cents per pound.  
Date of approval: <sup>a</sup>  
Date of beginning work: January 1, 1907.  
Date of expiration: March 17, 1907 (extended for a reasonable period).

## BUILDING ABOUT 100 FEET OF CHANOINE DAM, 2 BEAR-TRAP DAM FOUNDATIONS, EACH 93 FEET LONG, AND A CHANOINE WEIR 160 FEET LONG, 3 PIERS AND ABUTMENT, DAM NO. 3, OHIO RIVER.

Contractor: The Ohio River Contract Company, Evansville, Ind.  
Rates: Excavation, 80 cents per cubic yard; hemlock timber, \$50 per M feet B. M.; oak timber, \$80 per M feet B. M.; wrought iron and steel (including all metal except cast iron, bronze, and pipe), 6 cents per pound; cast iron, 6 cents per pound; bronze, 50 cents per pound; galvanized-iron pipe, 4-inch diameter, \$1 per linear foot; galvanized-iron pipe, 3-inch diameter, 90 cents per linear

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foot; black pipe, 2-inch diameter, 50 cents per linear foot; round piling, 65 cents per linear foot; sheet piling, \$90 per M feet B. M.; concrete, \$8.50 per cubic yard; stone crib filling, \$3 per cubic yard; large stone, \$3 per cubic yard; common filling, 75 cents per cubic yard; paving, vitrified brick, \$3 per square yard; crib decking, \$60 per M feet B. M.

Date of approval: June 10, 1905.

Date of beginning work: July 3, 1905.

Date of expiration: October 31, 1906 (extended for a reasonable period).

BUILDING AND ERECTING IN PLACE TWO BEAR-TRAP GATES AT DAM NO. 3, OHIO RIVER.

Contractor: The Ohio River Contract Company, Glenosborne, Pa.

Rates: Oak timber, \$100 per M feet B. M.; bronze, 50 cents per pound; cast iron, 6½ cents per pound; wrought iron, bolts, spikes, etc., 6½ cents per pound; painting ironwork of two gates, \$1,500; steel castings, 12 cents per pound; wrought steel, 8 cents per pound.

Date of approval: August 18, 1905.

Date of beginning work: August 30, 1905.

Date of expiration: September 18, 1906 (extended for a reasonable period).

BUILDING AND ERECTING IN PLACE TWO STEEL LOCK GATES AT LOCK NO. 3, OHIO RIVER.

Contractor: Lawrence D. Weaning, Cleveland, Ohio.

Rates: Timber, \$65 per M feet B. M.; bronze, 38 cents per pound; cast iron, 5.9 cents per pound; steel castings, 8.4 cents per pound; wrought steel (including all material except as enumerated above), 6.7 cents per pound; painting ironwork of two gates, \$900.

Date of approval: September 1, 1905.

Date of beginning work: September 15, 1905.

Date of expiration: July 31, 1906 (extended for a reasonable period).

FURNISHING AND DELIVERING 120 STEEL PLATES AND 38 STEEL I BEAMS AT DAM NO. 3, OHIO RIVER, GLENOSBORNE, PA.

Contractor: Penn Bridge Company, Beaver Falls, Pa.

Rates: Steel plates, 1.64 cents per pound; steel I beams, 1.97 cents per pound.

Date of approval: <sup>a</sup>

Date of beginning work: April 1, 1906.

Date of expiration: July 25, 1906.

FURNISHING AND DELIVERING AT GLENOSBORNE, PA., A STRUCTURAL-STEEL MOVABLE-SERVICE BRIDGE FOR DAM NO. 3, OHIO RIVER.

Contractor: N. D. Yant & Co., Allegheny, Pa.

Rates: Steel trestles complete with bolts and pins, 5 cents per pound; steel floor aprons, 4½ cents per pound; structural steel-abutment connection, 4½ cents per pound; structural steel for pier connection, 4 cents per pound; cast iron for pier connection, 4½ cents per pound.

Date of approval: <sup>a</sup>

Date of beginning work: April 3, 1906.

Date of expiration: July 31, 1906.

FURNISHING AND DELIVERING 27 STEEL POIRÉE TRESTLES AT DAM NO. 3, OHIO RIVER, GLENOSBORNE, PA.

Contractor: N. D. Yant & Co., Allegheny, Pa.

Rate: 3½ cents per pound.

Date of approval: <sup>a</sup>

Date of beginning work: April 11, 1906.

Date of expiration: July 31, 1906.

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<sup>a</sup> Emergency.

## EXCAVATING IN AND PAVING LOCK CHAMBER AT LOCK 3, OHIO RIVER.

Contractor: The Ohio River Contract Company, Evansville, Ind.  
Rates: Riprap stone, \$3.25 per ton; excavation, 45 cents per cubic yard.  
Date of approval: \*  
Date of beginning work: June 6, 1907.  
Date of expiration: August 22, 1907.

## BUILDING 352 FEET OF CHANOINE DAM, DAM NO. 4, OHIO RIVER.

Contractor: Baker & Egan, Pittsburg, Pa.

Rates, original contract: Excavation, 80 cents per cubic yard; hemlock timber, \$50 per M feet B. M.; oak timber, \$85 per M feet B. M.; cast iron, 5 cents per pound; cast iron, furnished by the United States, 1½ cents per pound; medium steel, 7 cents per pound; medium steel, furnished by the United States, 1½ cents per pound; bolts and washers, 5 cents per pound; concrete, \$6 per cubic yard; reinforcing steel, 5 cents per pound; stone filling (crib), \$3 per cubic yard; stone filling (above dam), \$3 per cubic yard; common filling, 60 cents per cubic yard; driftbolts, 5 cents per pound; ¾-inch galvanized iron pipe, 75 cents per linear foot; 4-inch galvanized iron pipe, \$1 per linear foot; sheet piling, \$90 per M feet B. M.

Rates, supplemental contract: For change of plan in the dam, the same unit prices to be paid for completed work in place as stated in original contract. The white oak piles, not mentioned in original contract, \$10 each in place.

Dates of approval: Original contract, August 13, 1904; supplemental contract, March 22, 1905.

Date of beginning work: August 23, 1904.

Date of expiration: November 1, 1905 (extended for a reasonable period).

## BUILDING ABOUT 98 FEET OF CHANOINE DAM, TWO BEAR-TRAP DAM FOUNDATIONS EACH 93 FEET LONG, A CHANOINE WEIR 160 FEET LONG, THREE PIERS AND ABUTMENT, DAM NO. 4, OHIO RIVER.

Contractor: Baker Contract Company (Incorporated), Pittsburg, Pa.

Rates: Excavation, 80 cents per cubic yard; hemlock timber, \$55 per M feet B. M.; oak timber, \$90 per M feet B. M.; wrought iron and steel (including all metal except cast iron, bronze, and pipe), 7 cents per pound; cast iron, 6 cents per pound; bronze, 50 cents per pound; galvanized-iron pipe, 4-inch diameter, \$1 per linear foot; galvanized iron pipe, 3-inch diameter, 75 cents per linear foot; black pipe, 2-inch diameter, 50 cents per linear foot; round piling, 65 cents per linear foot; sheet piling, \$90 per M feet B. M.; concrete, \$8 per cubic yard; stone crib filling, \$3 per cubic yard; large stone, \$3 per cubic yard; common filling, 60 cents per cubic yard; paving, vitrified brick, \$3 per square yard; riprap stone bank covering, \$3 per cubic yard; crib decking, \$60 per M feet B. M.

Date of approval: May 17, 1905.

Date of beginning work: June 9, 1905.

Date of expiration: October 31, 1906 (extended for a reasonable period).

## BUILDING AND ERECTING IN PLACE TWO BEAR-TRAP GATES AT DAM NO. 4, OHIO RIVER.

Contractor: Baker Contract Company, Pittsburg, Pa.

Rates: Oak timber, \$100 per M feet B. M.; bronze, 50 cents per pound; cast iron, 6 cents per pound; wrought-iron bolts, spikes, etc., 6½ cents per pound; steel castings, 10 cents per pound; wrought steel, 8 cents per pound; painting ironwork of two gates, \$1,500.

Date of approval: August 8, 1905.

Date of beginning work: August 21, 1905.

Date of expiration: September 18, 1906.

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\* Emergency.

FURNISHING AND DELIVERING A STEEL MOVABLE SERVICE BRIDGE AT DAM NO. 4,  
OHIO RIVER, LEGIONVILLE, PA.

Contractor: Milwaukee Bridge Company, Milwaukee, Wis.

Rates: Steel trestles complete with bolts and pins,  $4\frac{1}{2}$  cents per pound; steel floor aprons,  $4\frac{1}{2}$  cents per pound; steel abutment connections, 6 cents per pound; steel pier connections, 10 cents per pound; cast-iron wheels and guides, 10 cents per pound.

Date of approval: <sup>a</sup>

Date of beginning work: April 2, 1906.

Date of expiration: May 27, 1906 (extended for a reasonable period).

FURNISHING AND DELIVERING 120 STEEL PLATES AT DAM NO. 4, OHIO RIVER, LEGIONVILLE, PA.

Contractor: La Belle Iron Works, Steubenville, Ohio.

Rate: 1.65 cents per pound.

Date of approval: <sup>a</sup>

Date of beginning work: April 24, 1906.

Date of expiration: May 19, 1906.

FURNISHING AND DELIVERING 32 VALVE JACKS AT LOCK NO. 4, OHIO RIVER, LEGIONVILLE, PA.

Contractor: Sterrit-Thomas Foundry Company, Pittsburg, Pa.

Rate: \$2,800.

Date of approval: <sup>a</sup>

Date of beginning work: May 13, 1906.

Date of expiration: July 7, 1906.

BUILDING ABOUT 303 FEET OF CHANOINE DAM, 2 BEAR-TRAP DAM FOUNDATIONS, EACH 93 FEET LONG, A CHANOINE WEIR 96 FEET LONG, 3 PIERS AND ABUTMENT, DAM NO. 5, OHIO RIVER.

Contractor: The Dravo Contracting Company, Pittsburg, Pa.

Rates: Excavation, 70 cents per cubic yard; hemlock timber, \$50 per M feet B. M.; oak timber, \$90 per M feet B. M.; crib decking timber, \$55 per M feet B. M.; cast iron, 5 cents per pound; wrought iron and steel (including all metal except cast iron and bronze), 7 cents per pound; bronze, 40 cents per pound; concrete, \$7.50 per cubic yard; stone filling (crib), \$2.25 per ton; riprap stone, \$2.25 per ton; common filling, 50 cents per cubic yard; 3-inch galvanized-iron pipe, \$1 per linear foot; 4-inch galvanized-iron pipe, \$1.25 per linear foot; 2-inch black iron pipe, 40 cents per linear foot; brick paving, \$1.50 per square yard; sheet piling, \$95 per M feet B. M.; piling (round or bearing), 60 cents per linear foot.

Supplemental contract providing for change in method of payment.

Dates of approval: Original contract, May 13, 1905; supplemental contract, May 14, 1907.

Date of beginning work: June 4, 1905.

Date of expiration: October 31, 1906 (extended for a reasonable period).

BUILDING AND ERECTING IN PLACE TWO BEAR-TRAP GATES AT DAM NO. 5, OHIO RIVER.

Contractor: The Dravo Contracting Company, Pittsburg, Pa.

Rates: Oak timber, \$100 per M feet B. M.; bronze, 60 cents per pound; cast iron, 7 cents per pound; wrought iron, bolts, spikes, etc., 6 cents per pound; steel castings, 10 cents per pound; wrought steel,  $8\frac{1}{2}$  cents per pound; painting ironwork of two gates, \$1,500.

Supplemental contract providing for change in method of payment.

Dates of approval: Original contract, August 18, 1905; supplemental contract, May 14, 1907.

Date of beginning work: August 30, 1905.

Date of expiration: September 18, 1906 (extended for a reasonable period).

<sup>a</sup> Emergency.



**FURNISHING AND DELIVERING 38 STEEL I-BEAMS AT DAM NO. 5, OHIO RIVER, NEAR FREEDOM, PA.**

Contractor: Penn Bridge Company, Beaver Falls, Pa.  
Rate: 1.97 cents per pound.  
Date of approval:<sup>a</sup>  
Date of beginning work: March 24, 1906.  
Date of expiration: June 17, 1906 (extended for a reasonable period).

**FURNISHING AND DELIVERING 120 STEEL PLATES AT DAM NO. 5, OHIO RIVER, NEAR FREEDOM, PA.**

Contractor: Penn Bridge Company, Beaver Falls, Pa.  
Rate: 1.64 cents per pound.  
Date of approval:<sup>a</sup>  
Date of beginning work: March 24, 1906.  
Date of expiration: July 17, 1906.

**FURNISHING AND DELIVERING 11 STEEL TRETTLES AND 12 STEEL FLOOR APRONS AT DAM NO. 5, OHIO RIVER.**

Contractor: Penn Bridge Company, Beaver Falls, Pa.  
Rates: Steel trestles complete, with bolts and pins, 4.4 cents per pound;  
steel floor aprons with attachments, 4.5 cents per pound.  
Date of approval:<sup>a</sup>  
Date of beginning work: April 1, 1906.  
Date of expiration: July 25, 1906 (extended for a reasonable period).

**FURNISHING AND DELIVERING 32 VALVE JACKS AT LOCK NO. 5 SIDING, OHIO RIVER, FREEDOM, PA.**

Contractor: Charles Hegewald Company, New Albany, Ind.  
Rate: \$2,749.  
Date of approval:<sup>a</sup>  
Date of beginning of work: May 2, 1906.  
Date of expiration: July 6, 1906 (extended for a reasonable period).

**FURNISHING AND DELIVERING LUMBER AT DAM NO. 5, OHIO RIVER, NEAR FREEDOM, PA.**

Contractor: Anderson & Cook, Beaver, Pa.  
Rate: \$25 per M. feet B. M.  
Date of approval:<sup>a</sup>  
Date of beginning of work: May 17, 1906.  
Date of expiration: July 16, 1906.

**FURNISHING AND DELIVERING 90 STEEL OR WROUGHT-IRON WICKET PROPS, COMPLETE, FOR DAM NO. 5, OHIO RIVER.**

Contractor: L. D. Weaning, Cleveland, Ohio.  
Rate: 4.9 cents per pound.  
Date of approval:<sup>a</sup>  
Date of beginning work: July 21, 1906.  
Date of expiration: September 14, 1906.

**FURNISHING AND DELIVERING 127 CHANOINE WICKETS FOR DAM NO. 2, AND 112 CHANOINE WICKETS FOR DAM NO. 3, OHIO RIVER.**

Contractor: A. M. Bowman & Co., Pittsburg, Pa.  
Rates: White-oak timber, \$72 per M feet B. M.; medium steel, 4.6 cents per pound; cast-iron, 2½ cents per pound.  
Date of approval: January 16, 1906.  
Date of beginning of work: March 1, 1906.  
Date of expiration: June 30, 1906 (extended for a reasonable period).

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<sup>a</sup> Emergency.

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FURNISHING AND DELIVERING 32 VALVE JACKS AT EACH OF DAMS NOS. 2 AND 3, OHIO RIVER.

Contractor: J. & J. B. Milholland Company, Pittsburg, Pa.  
Rates: Valve jacks for Dam No. 2, \$2,876; valve jacks for Dam No. 3, \$2,851.  
Date of approval:<sup>a</sup>  
Date of beginning work: May 4, 1906.  
Date of expiration: June 30, 1906 (extended for a reasonable period).

FURNISHING AND DELIVERING LOCK-GATE OPERATING MACHINERY AT EACH OF DAMS NOS. 2 AND 3, OHIO RIVER.

Contractor: J. & J. B. Milholland Company, Pittsburg, Pa.  
Rates: Machinery for Dam No. 2, \$2,641; machinery for Dam No. 3, \$2,281.  
Date of approval:<sup>a</sup>  
Date of beginning work: May 9, 1906.  
Date of expiration: July 3, 1906 (extended for a reasonable period).

BUILDING AND ERECTING IN PLACE TWO STEEL LOCK GATES AT EACH OF LOCKS NOS. 2, 4, AND 5, OHIO RIVER.

Contractor: Penn Bridge Company, Beaver Falls, Pa.  
Rates: Timber, \$59 per M feet B. M.; bronze, 33 cents per pound; cast-iron, 6 cents per pound; wrought steel (including all material, except as enumerated above), 6.7 cents per pound; painting ironwork of two gates, \$650; steel castings, 9 cents per pound.  
Date of approval: August 31, 1905.  
Date of beginning work: September 30, 1905.  
Date of expiration: July 31, 1906 (extended for a reasonable period).

FURNISHING AND DELIVERING FOUR ENGINES AT DAM NO. 3, TWO ENGINES AT DAM NO. 4, AND TWO ENGINES AT DAM NO. 5, OHIO RIVER.

Contractor: Robinson Machine Company, Pittsburg, Pa.  
Rates: Engines delivered at Dam No. 3, \$630 each; engines delivered at Dam Nos. 4 and 5, \$600 each.  
Date of approval:<sup>a</sup>  
Date of beginning work: May 2, 1906.  
Date of expiration: May 30, 1906.

FURNISHING, DELIVERING, AND INSTALLING IN THE POWER HOUSE AT EACH OF DAMS NOS. 2, 3, 4, AND 5, OHIO RIVER, TWO 85-BRAKE HORSEPOWER GAS ENGINES.

Contractor: The Westinghouse Machine Company, Pittsburg, Pa.  
Rate: \$29,548.  
Date of approval: May 17, 1906.  
Date of beginning work: May 21, 1906.  
Date of expiration: October 15, 1906 (extended for a reasonable period).

FURNISHING, DELIVERING, AND INSTALLING IN THE POWER HOUSE AT EACH OF DAMS NOS. 2, 3, 4, AND 5, OHIO RIVER, TWO CHAIN-DRIVEN TWO-STAGE AIR COMPRESSORS.

Contractor: The Blaisdell Machinery Company, Bradford, Pa.  
Rate: \$11,490.  
Date of approval: May 17, 1906.  
Date of beginning work: May 21, 1906.  
Date of expiration: September 1, 1906 (extended for a reasonable period).

BUILDING TWO LOCK-KEEPER'S HOUSES AT EACH OF DAMS NOS. 3 AND 4, OHIO RIVER.

Contractor: Joseph Moscarelli, Beaver Falls, Pa.  
Rate: \$5,359.59 for each building at each site.  
Date of approval: May 24, 1906.  
Date of beginning work: June 17, 1906.  
Date of expiration: October 17, 1906 (extended for a reasonable period.)

<sup>a</sup> Emergency.

## FURNISHING AND DELIVERING LOCK-GATE OPERATING MACHINERY AT EACH OF DAMS NOS. 4 AND 5, OHIO RIVER.

Contractor: J. & J. B. Milholland Company, Pittsburg, Pa.

Rates: Machinery for Dam No. 4, \$2,281; machinery for Dam No. 5, \$2,361.

Date of approval:<sup>a</sup>

Date of beginning work: May 9, 1906.

Date of expiration: July 3, 1906 (extended for a reasonable period).

## F F 8.

## DREDGING POOLS NOS. 3, 4, AND 6, OHIO RIVER.

*Dredging pool No. 6.*—This work was in local charge of Mr. W. H. Chadbourn, jr., assistant engineer, from July 1 to 14, 1906, and of Mr. J. W. Arras, assistant engineer, from July 15 to end of fiscal year.

A contract for this work was let August 31, 1905, to the Monongahela and Western Dredging Company, of Pittsburg, Pa., for the removal of material at 19 cents per cubic yard. Work was commenced under the contract on September 1, 1905, and was completed on July 15, 1906. The contractor removed about 6,132 cubic yards this year and about 41,293 cubic yards in all. This dredging was carried down to an elevation a few inches lower than the top of the upper miter sill.

The only work yet to be done in connection with this undertaking is the removal of a few hundred cubic yards of gravel deposited alongside of the upper guide wall, which it is proposed to place on the terreplein.

*Dredging pools Nos. 3 and 4.*—This work was in local charge of Lieut. George R. Spalding, Corps of Engineers, and Capt. F. W. Altstaetter, Corps of Engineers, during the fiscal year.

This work, begun in August, 1905, was mainly completed in fiscal year 1906. The total amount of material handled during the fiscal year 1907 was 2,622 cubic yards, the total amount since beginning the work being 38,784 cubic yards. The work was done with dredging plant hired at the rate of \$11 an hour.

*Money statement.*

July 1, 1906, balance unexpended.....	\$10,768.55
Amount returned to general improvement fund.....	2,500.00
	8,268.55
June 30, 1907, amount expended during fiscal year, for works of improvement.....	3,603.16
July 1, 1907, balance unexpended.....	4,665.39

## ALLOTMENTS.

June 12, 1905, for dredging pool No. 6.....	\$20,800
August 30, 1905, withdrawn and allotted for dredging pools Nos. 3 and 4.....	10,350

<sup>a</sup> Emergency.

## CONTRACTS IN FORCE.

FURNISHING THE DREDGE BOAT VANDERBURG, WITH TWO SCOWS AND TENDER, FOR DOING CERTAIN DREDGING IN THE OHIO RIVER.

Contractor: The Ohio River Contract Company, Glenosborne, Pa.

Rate: \$11 per hour of actual work performed.

Date of approval: <sup>a</sup>

Date of beginning work: January 10, 1906.

Date of expiration: Twenty-four hours' notice.

## F F 9.

## OPERATING SNAG BOATS ON OHIO RIVER IN PENNSYLVANIA.

This work is carried on under allotments from the appropriation for operating snag boats on Ohio River. During this fiscal year it continued under local charge of Mr. S. H. Fowler, inspector.

A number of wrecks were reported at various places along the river as causing dangerous obstructions to navigation. Some of those reported went to pieces and floated away and some were removed by the owners of same. Ten wrecks and one boiler, approximating a total of about 4,450 tons, were removed by the United States. This work was done at various places along the river, as follows:

October 10, 1906. A wrecked fuel flat in the channel about 1,000 feet below Dam No. 5.

From November 23, 1906, to November 28, 1906. A coal barge in the channel opposite Beaver, Pa.; a fuel barge in the channel opposite lock wall at Dam No. 5; a coal boat and a coal barge in the channel below Dam No. 5, and a coal boat in the channel about three-fourths of a mile below the Beaver bridge.

December 11, 1906. A wrecked fuel flat in the channel opposite foot of Deadman Island.

December 31, 1906. A wrecked fuel flat in the channel at Lashells abutments, opposite Sewickley, Pa.

February 10, 1907. Wreck and boiler of the dismantled hull of the old U. S. S. *Slackwater*, in the channel below the Beaver bridge.

April 26, 1907. A coal barge in the channel opposite Industry, Pa.

## ALLOTMENTS.

July 27, 1905.....	\$3, 000. 00
July 20, 1906.....	1, 537. 64
Total.....	4, 537. 64

*Statement of expenditures for operating snag boats on the Ohio River, Pennsylvania, during the fiscal year 1907.*

Item.	Amount.
Office expenses and superintendence.....	\$164. 34
Services.....	304. 97
Fuel, explosives, etc.....	626. 08
General supplies and expenses.....	46. 00
Contingencies.....	183. 00
Total.....	1, 324. 39

<sup>a</sup> Emergency.

## F F 10.

OPERATING AND CARE OF LOCKS AND DAMS, OHIO RIVER,  
PENNSYLVANIA.

This work was under local charge of Mr. J. W. Arras, assistant engineer, during the fiscal year.

*Lock and Dam No. 1.*—Considering its physical condition, this structure performed its functions with entire satisfaction throughout the year. In addition to attending to its maneuvers and other routine work connected with its care and operation, considerable attention was again given to continuing renewal of its movable parts, which, during the long period it has been in operation, have greatly deteriorated. Progress made along this line has greatly improved its condition and facilitated its operation. As far as possible all renewed parts are being constructed along more modern lines, stronger and heavier, than the original.

Three new trestles and six new floor sections, manufactured during the previous year, were erected in place, and three old trestles and one floor section repaired and replaced; a concrete culvert 9 by 11 by 60 feet long, through which to empty lock, was constructed at lower lock-gate recess; 118 cubic yards of concrete were placed in this structure; hydraulic pipe lines to valve-operating jack on river wall of lock were repaired; an iron water tank, 5 by 5 by 12 feet, was constructed in connection with lower boiler house of three-eighths-inch plates and other material in stock; concrete steps between levels of lock wall and raised esplanade were constructed in front of lock house and a concrete retaining wall 8 feet high at the rear end of upper gate recess to support railroad embankment; material repairs were made to boiler at lower lock gate, extension built to coal bin of lower boiler house, 8 by 18 by 30 feet, and a tramway built for transportation of coal thereto from barges, and a new mast and stiff legs for derrick erected on maneuvering boat.

A new boiler for steam launch *Wenonah*, furnished by The Taylor Water Tube Boiler Company, of Detroit, Mich., was installed in October, 1906, but, proving unsatisfactory, was replaced by another boiler furnished by the same company in the spring of 1907. The latter boiler has thus far given satisfaction. The cabin of the steam launch was also equipped with heating coils.

At the end of the season of 1906 arrangements were made for the construction of 40 new wickets. The lumber for same was prepared at the Government mill at Lock No. 4, Monongahela River, and the irons procured under contract. The wickets were constructed by the operating force, but the continued high stage of water has not permitted their erection in place. Nine wicket horses were removed, riveted, and replaced in dam, together with three new ones. Also four props were straightened and replaced, and three unserviceable props in weir No. 3 replaced by altered props from weir No. 1.

The month of October, 1906, was attended by a continuous stage of moderately high water, through which, owing to the extremely large quantity of coal stored in Davis Island pool, Pittsburg Harbor, the navigable pass and weir No. 2 were not lowered, the surplus water being passed through weir No. 3 and the bear-trap opening. The highest stage reached below the dam during this period was

7.6 feet. This condition produced considerable scour below weir No. 3 of the dam, especially at Davis Island, not, however, endangering foundation of dam. To arrest the scour at the island 260 cubic yards of riprap stone were placed along its shore. Owing to the favorable condition of the open river below the dam for navigation, 276 lockages were made during this month alone, which is probably the largest number of lockages ever made in one month at Davis Island dam.

The esplanade was raised to its proposed elevation from the lock house upstream to head of upper guide wall with material furnished and unloaded by the Pennsylvania Company without cost to the United States, but distributed by the Government. About 12,300 cubic yards of material entered into this work. Also 420 cubic yards of material were placed below lock house by the Dravo Contracting Company, Pittsburg, Pa.

Thus far the season of 1907 has been remarkable in that it furnished the highest stage of water on record in this locality. At Davis Island lock the exact reading of the crest on March 15 was 34.19 feet above zero of the gauge. This exceeds the highest previous freshet of February 10, 1832, by about 6 inches. The only loss sustained at Dam No. 1 was an old carpenter shop and tool house, 20 by 60 feet, located on Davis Island, together with about \$300 worth of tools and appliances stored therein. A dam tender's house on Davis Island was also slightly damaged by ice and drift. So much sediment was carried in suspension by this freshet that it became necessary to build cofferdams across lock-gate recesses, unwater same, and remove the deposits, which at the two gates aggregated about 700 cubic yards. This occasion also furnished an opportunity of making slight repairs to the lock gates and the emptying valves in lower recess wall. To prevent its destruction 200 linear feet of temporary bracket dam on foundation of drum weir were removed prior to freshet, and subsequently replaced.

During the year the dam was maneuvered as follows:

Raised.	Lowered.	Days up.
August 15, 1906.....	August 10, 1906.....	41
August 26, 1906.....	August 20, 1906.....	5
December 1, 1906.....	November 19, 1906.....	85
June 26, 1907.....	December 7, 1906.....	6
		5
Total.....		142

*Lock and Dam No. 2.*—This structure was assigned to Operating and Care on October 13, 1906. The permanent power plant not having yet been installed, a temporary steam plant, made up of boilers used during construction, was used for operation of the lock.

The first occasion to raise the dam occurred on November 8. Considerable difficulty was experienced in passing the contractor's gravel cofferdam located about 250 feet from the bear-trap pier, in consequence of which the dam was not entirely raised until the 12th. On the following day the wooden bear trap, 102 feet 4 inches long, was raised satisfactorily. Owing to the great height of this dam, and the absence of a pool below it, pool No. 2 was not permitted

to rise above 3 feet below the crest of dam. The maneuvers of the long Chanoine wickets were entirely satisfactory except that the lengthened props tended to lodge in the floor of dam foundation, frequently preventing wickets from falling to their lowest position. Steps will be taken to overcome this difficulty when the water reaches a proper stage.

The operation of the emptying and filling valves of the lock with individual jacks proved successful. Owing to low temperatures the operations in November and December, 1906, were made with the use of oil in the jacks.

After lowering the dam for the last time in December, 1906, the operating force devoted itself energetically to a general conversion of construction conditions to operating conditions, razing and altering temporary buildings, dismantling old and fitting up new machinery, relaying pipe lines, fitting up buildings with water service, etc., placing concrete floors in cellars of lock houses, installing mooring rings and snubbing posts on bar-trap piers, placing water gauges and lights for illuminating purposes at lock, etc.

After the rise of March, 1907, sedimentary deposits to a depth of 7½ feet were found in the lock-gate recesses. The recesses were inclosed with cofferdams, and material to the amount of 1,350 cubic yards were removed. During the freshet the only losses sustained at this structure were about 35,000 feet of old timber removed from faces of lock walls, and a small amount of manila rope.

During the winter a steamboat with a large tow of coal, while passing over the dam in distress, disrupted three wickets, horses and props, which, owing to the stage of water, have not been recovered. Provision has been made for the temporary closure of this gap until the recovery of the lost parts.

During the past year the dam was maneuvered as follows:

Raised.	Lowered.	Days up.
November 8, 1906 .....	November 19, 1906 .....	11
December 1, 1906 .....	December, 6, 1906 .....	5
June 29, 1907 .....	.....	2
Total .....	.....	18

*Lock and Dam No. 6.*—Nothing of special note occurred at this structure to interfere with its usual operations.

Only slight repairs were required to parts of the main structure. Some material was added to the esplanade and small repairs to highway adjoining the lock buildings.

One of the dam tenders' houses underwent considerable repairs, a 225-barrel cistern also being added.

In the operation of this dam during the working season of 1906 the pool was so regulated as to facilitate operations on the construction of Lock and Dam No. 5.

The freshet of March 15, 1907, reached a height of 47.2 feet here, being about 3 inches lower than the highest previous rise of February 6, 1884. Considerable minor injury was done to lock buildings—nearly all glass in first story of lock houses being broken, water conductors damaged beyond repair, one front porch column destroyed

and rear porches torn away. Practically all the necessary repairs had been completed at the end of the fiscal year.

Sedimentary deposits at this lock during the March freshet, although smaller than at upper locks, nevertheless required removal by means of a cofferdam at the upper gate recess. About 300 cubic yards of material were taken out.

During the year the dam was maneuvered as follows:

Raised.	Lowered.	Days up.
August 17, 1906.....	August 8, 1906.....	39
August 27, 1906.....	August 20, 1906.....	5
November 6, 1906.....	October 8, 1906.....	42
	November 12, 1906.....	6
Total.....		90

## ALLOTMENTS.

August 3, 1885.....	\$5,865.00	July 26, 1898.....	\$9,620.71
July 10, 1886.....	12,015.00	February 7, 1899.....	3,000.00
January 28, 1887.....	6,700.00	June 24, 1899.....	1,200.00
July 1, 1887.....	12,355.00	July 19, 1899.....	23,459.69
February 25, 1888.....	3,500.00	January 13, 1900.....	3,230.00
July 11, 1888.....	18,015.00	June 18, 1900.....	45,000.00
August 20, 1889.....	12,073.00	July 17, 1900.....	47,456.07
May 14, 1890.....	2,000.00	February 26, 1901.....	2,000.00
July 17, 1890.....	14,752.00	June 28, 1901.....	10,000.00
October 7, 1890.....	14,800.00	July 18, 1901.....	42,530.54
July 10, 1891.....	10,338.00	August 8, 1902.....	23,889.09
July 21, 1892.....	11,831.48	July 20, 1903.....	65,107.55
June 27, 1893.....	1,300.00	July 21, 1904.....	2,512.21
July 22, 1893.....	12,253.82	August 3, 1904.....	<sup>a</sup> 18,500.00
July 18, 1894.....	12,459.02	July 25, 1905.....	<sup>b</sup> 41,044.11
May 25, 1895.....	450.00	July 23, 1906.....	<sup>b</sup> 30,245.17
July 9, 1895.....	30,661.54	October 13, 1906.....	<sup>c</sup> 14,200.00
July 28, 1896.....	15,531.57	June 21, 1907.....	<sup>b</sup> 2,500.00
May 17, 1897.....	1,200.00		
July 23, 1897.....	9,898.62	Total.....	<sup>d</sup> 593,894.19
November 20, 1897.....	400.00		

*Statement of expenditures for operating and care of locks and dams, Ohio River, Pennsylvania, during the fiscal year 1907.*

Item.	Amount.
Salaries and wages of regular hired labor force.....	\$30,614.17
Miscellaneous supplies and services.....	6,835.55
Miscellaneous repairs.....	6,338.22
Rebuilding wickets, maneuvering boat hull, and extending main emptying culvert of Lock and Dam 1.....	7,250.00
Contingencies.....	4,789.50
Total.....	56,027.44

<sup>a</sup> Lock No. 6.

<sup>b</sup> Locks Nos. 1 and 6.

<sup>c</sup> Lock No. 2.

<sup>d</sup> Of this amount there was undrawn or deposited \$1,010.



## CONTRACT IN FORCE.

FURNISHING AND DELIVERING AT DAVIS ISLAND DAM, OHIO RIVER, 22 HORSES AND IRONS FOR 40 CHANOINE WICKETS.

Contractor: Penn Bridge Company, Beaver Falls, Pa.

Rates: Cast iron, 2.95 cents per pound; wrought iron and steel, 6.65 cents per pound.

Date of approval: <sup>a</sup>

Date of beginning work: January 7, 1907.

Date of expiration: March 18, 1907 (extended for a reasonable period).

## COMMERCIAL STATISTICS.

*Traffic through Locks and Dams Nos. 1, 2, and 6, Ohio River, during the fiscal year 1907, as measured by the commerce through Lock and Dam No. 1.*

Commodity.	Number.	Commodity.	Tons. <sup>a</sup>
Packets .....	669	Coal .....	3,024,210
Towboats .....	2,597	Iron and steel products .....	89,150
Model barges .....	72	Sand .....	115,460
Coal boats .....	2,656	Gravel .....	46,635
Barges .....	5,596	Lumber .....	19,736
Flats .....	5,175	Miscellaneous .....	74,390
Rafts .....	33		
Miscellaneous .....	1,102	Total .....	3,819,631
Total .....	17,900		

<sup>a</sup> 2,000 pounds.

## F F II.

## IMPROVEMENT OF HARBOR AT PITTSBURG, PENNSYLVANIA.

This work was in local charge of Mr. H. C. Gould, assistant engineer, during the fiscal year.

*Maintenance.*—The condition of the navigation channels in the harbor continued good during the year and no dredging for their maintenance was necessary. Four wrecks were removed by dredges, as follows: Old wharf boat at McKeesport; a barge in the Allegheny River near Sixth Street Bridge; a coal boat just below Lock 1, Monongahela River, and a barge at the upper end of same lock.

*Inspection.*—Patrol of the rivers and banks was continued, resulting in the stoppage of improper deposits and removal of deposits at a great many places. Inspection of structures, etc., beyond the harbor lines, built under War Department permits, and examination of work on the banks near the harbor lines were maintained throughout the harbor, in order to prevent encroachments. Supervision of the work of commercial sand dredgers was continued and special efforts were made to prevent the leaving of waste piles and to secure removal of same when made. The gasoline launch *Luzon* was in commission all

<sup>a</sup> Emergency.

the year, except from March 26 to April 13, 1907, when the boat was docked for painting and repairing hull. A sheathing of galvanized sheet iron and a heavy rubbing strip of oak at top of the sheathing were put on.

*Local surveys and maintenance of harbor-line marks.*—The markings of the harbor lines were renewed at some places where disturbed by floods or reconstruction, and additional markings were put in at a number of places. Some important triangulation points at junction of the three rivers were relocated and marked. Several new triangulation points were put in at the head of Herr Island, Allegheny River.

*Changes of harbor line.*—The change of harbor line on right bank at head of Ohio River, referred to in preceding annual report, was approved October 1, 1906. The changes of the lines in back channel at Brunot Island, Ohio River, also mentioned in preceding annual report, were approved February 23, 1907. A change of the line along National Tube Company's works on right bank of Monongahela River, just above Lock 1, was approved March 30, 1907. Public hearings were held on three dates for consideration of a change of harbor line on right bank of the Allegheny River at Six-Mile Island, involving a removal of that island by the Pennsylvania Railroad Company. Final report on this change is awaiting settlement of some property matters by the railroad company.

*Miscellaneous.*—The decision of the United States Supreme Court concerning changes ordered by the Secretary of War in the Union Bridge, at mouth of Allegheny River, being in favor of the Government, the removal of the bridge was started by the bridge company on May 1, 1907. Nearly all the superstructure was off the piers by the end of June.

A new sheet showing existing harbor lines from about 3,000 feet below head of Ohio River to Ninth Street Bridge, Allegheny River, was prepared and was approved by the Secretary of War on October 1, 1906. Two more sheets showing existing lines, markings, etc., on the Monongahela River, to above the Twenty-second Street Bridge, were prepared and are nearly ready to be forwarded.

Examinations and reports were made on eight applications for permits for various structures in the harbor.

#### *Money statement.*

July 1, 1906, balance unexpended.....	\$940. 58
Received by transfer settlement.....	4, 000. 00
Amount appropriated by river and harbor act approved March 2, 1907.....	10, 000. 00
Received from sale of blueprints.....	20. 89
	<hr/> 14, 961. 47
June 30, 1907, amount expended during fiscal year, for maintenance of improvement.....	9, 349. 22
	<hr/>
July 1, 1907, balance unexpended.....	5, 612. 25
July 1, 1907, outstanding liabilities.....	477. 73
	<hr/>
July 1, 1907, balance available.....	5, 134. 52
	<hr/>
{ Amount that can be profitably expended in fiscal year ending June 30, 1909, for maintenance of improvement, in addition to the balance unexpended July 1, 1907.....	
{ Submitted in compliance with requirements of sundry civil act of June 4, 1897, and of section 7 of the river and harbor act of 1890.....	
	10, 000. 00

## APPROPRIATIONS.

March 3, 1899.....	\$110,662.90
June 13, 1902.....	10,000.00
June 13, 1902 (allotment).....	5,000.00
March 3, 1905.....	10,000.00
November 23, 1906, received by Treasury certificate of transfer settlement.....	4,000.00
March 2, 1907.....	10,000.00
Received from other sources.....	20.89
Total .....	149,683.79

## COMMERCIAL STATISTICS.

*Classified statement of river traffic in Pittsburg Harbor for calendar year 1906.*

Commodities.	Tons. <sup>a</sup>	Commodities.	Tons. <sup>a</sup>
Barges (new) .....	6,900	Miscellaneous .....	91,847
Bottoms, coal boat (new).....	8,712	Sand .....	1,218,806
Braces, poles, posts, etc.....	15,586	Steel and iron products, miscellaneous.....	88,180
Brick .....	38	Stone.....	2,816
Coal .....	9,729,861	Ties, railroad.....	2,160
Coke .....	3,200	Timber.....	88,682
Farm products.....	1,792	Total .....	12,927,975
General merchandise.....	26,946	Passengers.....number..	271,460
Gravel .....	1,680,721		
Lumber.....	15,964		
Live stock .....	824		

<sup>a</sup> 2,000 pounds.

NOTE.—The table gives only actual amounts of articles handled, care being taken not to duplicate any items. It should be stated that a very large part of this commerce is stored in the harbor from a week to several months and then rehandled and shipped out and the empties returned. Neither the rehandling nor the return of empties are considered in the table.



## APPENDIX G G.

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CONSTRUCTION OF LOCKS AND DAMS IN OHIO RIVER BETWEEN THE PENNSYLVANIA STATE LINE AND CINCINNATI, OHIO, AND IMPROVEMENT OF KANAWHA AND LITTLE KANAWHA RIVERS, WEST VIRGINIA.

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REPORT OF CAPT. F. C. BOGGS, CORPS OF ENGINEERS, OFFICER IN CHARGE FOR THE FISCAL YEAR ENDING JUNE 30, 1907.

### IMPROVEMENTS.

- |   |  |
|---|--|
| 1. Movable dams in Ohio River.  | 4. Kanawha River, West Virginia.   |
| 2. Little Kanawha River, West Virginia.                                       | 5. Operating and care of locks and dams on Kanawha River, West Virginia. |
| 3. Operating and care of lock and dam on Little Kanawha River, West Virginia. |  |

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UNITED STATES ENGINEER OFFICE,  
*Wheeling, W. Va., July 9, 1907.*

GENERAL: I have the honor to transmit herewith the annual report of the works under my charge for the fiscal year ending June 30, 1907.

The following employees were in local charge of the works:

William M. Hall, assistant engineer, Dam No. 18, Ohio River, and Little Kanawha River; Thomas E. Jeffries, assistant engineer, Kanawha River; Frank D. Holbrook, junior engineer, Dam No. 11, Ohio River; and George S. Patrick, inspector, Dam No. 13, Ohio River.

Very respectfully, your obedient servant,

F. C. Boggs,  
*Captain, Corps of Engineers.*

Brig. Gen. A. MACKENZIE,  
*Chief of Engineers, U. S. A.*

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### G G I.

MOVABLE DAMS IN OHIO RIVER BETWEEN THE PENNSYLVANIA STATE LINE AND CINCINNATI.

OPERATIONS DURING THE FISCAL YEAR ENDING JUNE 30, 1907.

*Dam No. 8, about 46 miles below Pittsburg, Pa.*—The construction of the masonry for lock and guide walls was commenced July 25, 1904, by The T. A. Gillespie Company, of Pittsburg, Pa. Although the work was prosecuted with a good force and sufficient plant, the

company was unable to complete within the time limit; an extension was granted.

To provide for a 9-foot navigable depth, as required by the river and harbor act of March 2, 1907, a supplemental agreement was entered into covering the raising of the lock and guide walls which makes October 1, 1907, as the date for completion. Considerable work was done toward raising the walls and esplanade.

The following is a statement of the work accomplished:

Grubbing and clearing	acres	1.50
Timber	feet B. M.	16,805.00
Sheet piling	linear feet	8,025.00
Round piling	do	9,083.00
Filling	cubic yards	21,618.00
Stone filling	do	2,067.00
Excavation	do	24,092.70
Concrete	do	14,536.89
Iron and steel	pounds	122,930.50
Cast-iron pipe	linear feet	68.50
Galvanized-iron pipe	do	30.00

The placing of supply pipes in the lock was well under way; additional borings were made to determine character of material at site for dam; and plans for the dam are in preparation.

*Dam No. 11, about 77 miles below Pittsburg, Pa.*—Progress has been very unsatisfactory at this site, due to insufficient plant and materials. Work was commenced on the lock and guide walls by the Aetna Construction Company, of Wheeling, W. Va., on July 17, 1904. It was necessary to grant the company an extension of time in which to complete its contract.

Congress having provided for a 9-foot navigable depth, a supplemental agreement was entered into covering the raising of the lock and guide walls and allowing until December 1, 1907, in which to complete the lock and guide walls. A small amount of filling was placed and some stone filling relaid under the supplemental agreement.

The following is a statement of the work accomplished:

Grubbing and clearing	acres	0.50
Timber	feet B. M.	11,881.00
Sheet piling	linear feet	40,623.10
Round piling	do	30,705.90
Filling	cubic yards	7,975.00
Stone filling	do	651.00
Excavation	do	5,414.00
Concrete	do	11,009.37
Iron and steel	pounds	84,233.40
Cast-iron pipe	linear feet	65.00
Galvanized-iron pipe	do	60.50

Plans for the lock supply pipes were completed, and the work advertised.

*Dam No. 13, about 96 miles below Pittsburg, Pa.*—The Sheridan-Kirk Contract Company, of Nicholasville, Ky., completed the work under its contract for building lock walls and part of the guide walls on November 19, 1906. The following work was accomplished:

Piling	linear feet	280.00
Excavation	cubic yards	3,842.35
Channel dredging	do	23,760.00
Filling	do	1,184.30
Stone filling	do	2,078.15
Timber	feet B. M.	44,073.98
Iron and steel	pounds	4,432.15

Supply pipes for the lock were placed by the Kiel Brothers Plumbing and Heating Company, of Wheeling, W. Va.

Under contract with The Hollerbach & May Contract Company, of Evansville, Ind., good progress was made toward the construction of the dam. The following is a statement of the material placed and excavated during the fiscal year:

Excavation .....	cubic yards..	7, 479. 85
Rock excavation .....	do.....	3, 697. 62
Filling .....	do.....	4, 393. 60
Stone filling .....	do.....	1, 176. 36
Riprap .....	do.....	385. 20
Gravel .....	do.....	27. 40
Concrete .....	do.....	8, 510. 27
Timber .....	feet B. M.	87, 772. 61
Sheet piles .....	linear feet..	3, 679. 58
Round piles .....	do.....	6, 608. 20
Drill holes .....	do.....	75. 20
Pipe and fittings .....	do.....	1, 452. 25
Iron and steel .....	pounds.....	235, 404. 65

The plan of bear-trap gates approved is of the reversed Parker gate design.

Contracts were entered into with G. Elias & Bro., of Buffalo, N. Y., for surfaced lumber, and with the J. & J. B. Milholland Company, of Pittsburg, Pa., for iron and steel required for the construction of the bear-trap gates.

Plans for a power house were in preparation.

*Dam No. 18, about 179 miles below Pittsburg, Pa.*—Work on the dam has been very unsatisfactory. In November, 1906, the Baker Contract Company failed, and the work is being carried on by the receiver, the Colonial Trust Company, of Pittsburg.

To place the work in proper advancement, the United States took charge from November 21, 1906, to the latter part of January, 1907; but the weather conditions were unfavorable and little permanent work was accomplished, although serious damage was averted.

Unless much better progress is made, it is doubtful if the work will be completed within the time limit. The following is a statement of the work accomplished:

Excavation .....	cubic yards..	6, 734
Filling .....	do.....	8, 997
Stone filling .....	do.....	384
Timber .....	feet B. M.	88, 365
Iron and steel .....	pounds.....	528, 840
Concrete .....	cubic yards..	5, 280
Bolt holes .....	linear feet..	144
Galvanized-iron pipe .....	do.....	1, 272
Round piles .....	number.....	22
Sheet piles .....	do.....	76

A contract was entered into with The Atlas Portland Cement Company for the cement required in constructing the dam.

Plans for lock gates and operating machinery were in preparation. Plans for both bear-trap gates were approved, the design being that used on the upper Ohio. The iron and steel for the bear-trap gate next the abutment is being furnished under contract with the Pittsburgh Industrial Iron Works, of Pittsburg, Pa. Advertisements were issued for the surfaced lumber required.

*Dam No. 19, about 191 miles below Pittsburg, Pa.*—No work done.

*Dam No. 26.*—Preparations were made for locating the site.

A Board was appointed for considering all plans for construction in the Pittsburg, Wheeling, and Cincinnati districts, with a view to uniformity of design. Plans for dam, lock gates, operating machinery, power house, etc., have been submitted from this district.

The final effect of the work of this Board will be to materially expedite the preparation of plans, as well as to make them uniform. Due, however, to the rush of work in the various districts at this time of year and the desire of the Board to obtain the best plans, the preparation of plans in this district has been somewhat delayed.

*Money statements.*

DAM NO. 8.

July 1, 1906, balance unexpended.....	\$203,397. 65
Amount appropriated by river and harbor act approved March 2, 1907.....	251,845. 00
	<hr/> 455,242. 65
June 30, 1907, amount expended during fiscal year, for works of improvement.....	148,746. 79
July 1, 1907, balance unexpended.....	306,495. 86
July 1, 1907, outstanding liabilities.....	858. 49
July 1, 1907, balance available.....	<hr/> 305,637. 37
July 1, 1907, amount covered by uncompleted contracts.....	161,126. 60
Amount (estimated) required for completion of existing project.....	<hr/> 500,000. 00
<div> <div>{</div> <div>Amount that can be profitably expended in fiscal year ending June 30, 1909, for works of improvement, in addition to the balance unexpended July 1, 1907.....</div> <div>250,000. 00</div> <div>Submitted in compliance with requirements of sundry civil act of June 4, 1897.</div> </div>	

DAM NO. 11.

July 1, 1906, balance unexpended.....	\$326,750. 58
Amount appropriated by river and harbor act approved March 2, 1907.....	198,343. 00
	<hr/> 525,093. 58
June 30, 1907, amount expended during fiscal year, for works of improvement.....	100,885. 03
July 1, 1907, balance unexpended.....	424,208. 55
July 1, 1907, outstanding liabilities.....	577. 51
July 1, 1907, balance available.....	<hr/> 423,631. 04
July 1, 1907, amount covered by uncompleted contracts.....	255,323. 10
Amount (estimated) required for completion of existing project.....	<hr/> 500,000. 00
<div> <div>{</div> <div>Amount that can be profitably expended in fiscal year ending June 30, 1909, for works of improvement, in addition to the balance unexpended July 1, 1907.....</div> <div>200,000. 00</div> <div>Submitted in compliance with requirements of sundry civil act of June 4, 1897.</div> </div>	



## DAM NO. 13.

July 1, 1906, balance unexpended.....	\$324,843.08
Amount appropriated by river and harbor act approved March 2, 1907.....	174,778.00
Amount appropriated by sundry civil act approved March 4, 1907.....	100,000.00
Received from sale.....	48.62
	<hr/>
June 30, 1907, amount expended during fiscal year, for works of improvement.....	599,669.70
	<hr/>
July 1, 1907, balance unexpended.....	176,013.15
July 1, 1907, outstanding liabilities.....	423,656.55
	<hr/>
July 1, 1907, balance available.....	673.96
	<hr/>
July 1, 1907, amount covered by uncompleted contracts.....	422,982.59
	<hr/>
July 1, 1907, amount covered by uncompleted contracts.....	267,618.21
	<hr/>
Amount (estimated) required for completion of existing project.....	300,000.00
	<hr/>
{ Amount that can be profitably expended in fiscal year ending June 30, 1909, for works of improvement, in addition to the balance unexpended July 1, 1907.....	185,000.00
Submitted in compliance with requirements of sundry civil act of June 4, 1897.	

## DAM NO. 18.

July 1, 1906, balance unexpended.....	\$292,342.82
Amount appropriated by sundry civil act approved March 4, 1907.....	178,000.00
	<hr/>
June 30, 1907, amount expended during fiscal year, for works of improvement.....	470,342.82
	<hr/>
July 1, 1907, balance unexpended.....	103,672.84
July 1, 1907, outstanding liabilities.....	366,669.98
	<hr/>
July 1, 1907, balance available.....	1,232.15
	<hr/>
July 1, 1907, amount covered by uncompleted contracts.....	365,437.83
	<hr/>
July 1, 1907, amount covered by uncompleted contracts.....	166,580.46
Amount (estimated) required for completion of existing project.....	100,000.00
	<hr/>

## DAM NO. 19.

July 1, 1906, balance unexpended.....	\$107,988.36
Amount appropriated by river and harbor act approved March 2, 1907.....	200,000.00
	<hr/>
Amount appropriated by act of March 3, 1905, repealed by act of March 2, 1907.....	307,988.36
	<hr/>
July 1, 1907, balance unexpended.....	100,000.00
July 1, 1907, outstanding liabilities.....	207,988.36
	<hr/>
July 1, 1907, balance available.....	177.60
	<hr/>
July 1, 1907, balance available.....	207,810.76
	<hr/>
Amount (estimated) required for completion of existing project.....	725,000.00
	<hr/>
{ Amount that can be profitably expended in fiscal year ending June 30, 1909, for works of improvement, in addition to the balance unexpended July 1, 1907.....	200,000.00
Submitted in compliance with requirements of sundry civil act of June 4, 1897.	

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## DAM NO. 28.

July 1, 1906, balance unexpended .....	\$35,000. 00
Amount appropriated by act of March 3, 1905, repealed by act of March 2, 1907 .....	35,000. 00
Amount appropriated by river and harbor act approved March 2, 1907 .....	235,000. 00
June 30, 1907, amount expended during fiscal year, for works of improvement .....	42. 35
July 1, 1907, balance unexpended .....	234,957. 65
July 1, 1907, outstanding liabilities .....	238. 95
July 1, 1907, balance available .....	234,718. 70
Amount (estimated) required for completion of existing project .....	965,000. 00
<div> <div>{</div> <div>Amount that can be profitably expended in fiscal year ending June 30, 1909, for works of improvement, in addition to the balance unexpended July 1, 1907 .....</div> <div>200,000. 00</div> </div>	
<div> <div>{</div> <div>Submitted in compliance with requirements of sundry civil act of June 4, 1897.</div> </div>	

## CONSOLIDATED.

July 1, 1906, balance unexpended .....	\$1,290,322. 49
Amount appropriated by river and harbor act approved March 2, 1907 .....	1,059,966. 00
Amount appropriated by sundry civil act approved March 4, 1907 .....	278,000. 00
Received from sale .....	48. 62
	2,628,337. 11
Amount appropriated by act of March 3, 1905, repealed by act of March 2, 1907 .....	135,000. 00
	2,493,337. 11
June 30, 1907, amount expended during fiscal year, for works of improvement .....	529,360. 16
July 1, 1907, balance unexpended .....	1,963,976. 95
July 1, 1907, outstanding liabilities .....	3,758. 66
July 1, 1907, balance available .....	1,960,218. 29
July 1, 1907, amount covered by uncompleted contracts .....	850,648. 37
Amount (estimated) required for completion of existing project .....	3,090,000. 00
<div> <div>{</div> <div>Amount that can be profitably expended in fiscal year ending June 30, 1909, for works of improvement, in addition to the balance unexpended July 1, 1907 .....</div> <div>1,035,000. 00</div> </div>	
<div> <div>{</div> <div>Submitted in compliance with requirements of sundry civil act of June 4, 1897.</div> </div>	

## APPROPRIATIONS.

March 3, 1899:	
Construction of Dam No. 13 .....	\$50,000
Construction of Dam No. 18 .....	50,000
June 6, 1900, continuing construction of Dams Nos. 13 and 18 .....	470,000
March 3, 1901, continuing construction of Dams Nos. 13 and 18 .....	40,000
June 13, 1902:	
Construction of Lock and Dam No. 8 .....	50,000
Construction of Lock and Dam No. 11 .....	50,000
Construction of Lock and Dam No. 19 .....	25,000
June 28, 1902, continuing construction of Dams Nos. 13 and 18 .....	48,600

<b>March 3, 1903:</b>	
Continuing construction of lock at Dam No. 8.....	\$200,000
Continuing construction of lock at Dam No. 11.....	200,000
Continuing construction of Dams Nos. 13 and 18.....	450,000
<b>April 28, 1904:</b>	
Continuing construction of Dam No. 8.....	50,000
Continuing construction of Dam No. 11.....	50,000
<b>March 3, 1905:</b>	
Completion of locks at Dams Nos. 8 and 11.....	160,000
Continuing construction of Dams Nos. 13 and 18.....	100,000
Construction of Lock and Dam No. 19.....	* 100,000
Purchase of site for Lock and Dam No. 26.....	* 35,000
<b>June 30, 1906:</b>	
Construction of locks at Dam Nos. 8 and 11.....	160,000
Continuing construction of Dams Nos. 13 and 18.....	160,400
<b>March 2, 1907:</b>	
Construction of Lock and Dam No. 8.....	251,845
Construction of Lock and Dam No. 11.....	198,343
Construction of Locks and Dams Nos. 13 and 18.....	174,778
Lock and Dam No. 19.....	200,000
Construction of Lock and Dam No. 26.....	* 100,000
<b>March 4, 1907, construction of Dams Nos. 13 and 18.....</b>	<b>278,000</b>
<b>Total.....</b>	<b>3,649,966</b>

NOTE.—Received from sale, \$48.62.

#### CONTRACTS IN FORCE.

##### LOCK FOR MOVABLE DAM NO. 8.

Contractor: The T. A. Gillespie Company.

Rate: Grubbing and clearing at \$100 per acre; timber, \$35 per thousand; sheet piling, 50 cents per linear foot; round piling, 41 cents per linear foot; common filling, 30 cents per cubic yard; stone filling, \$2 per cubic yard; stone steps, \$1.25 per linear foot; common excavation, 50 cents per cubic yard; concrete, \$5.95 per cubic yard; white-oak timber, \$60 per thousand; paving, \$6 per cubic yard; bolt holes, \$1 per linear foot; iron and steel, 6 cents per pound; cast-iron pipe, 6-inch, \$1.50 per linear foot; galvanized-iron pipe, 3-inch, \$1 per linear foot; galvanized-iron pipe, 1½-inch, 60 cents per linear foot.

Date of approval: June 24, 1904.

Date of beginning: July 27, 1904.

Date of expiration: October 1, 1907.

##### DRILLING TEST HOLES FOR DAM NO. 8.

Contractor: The Preslar Prospecting and Engineering Company.

Rate: Drilling through loose material at \$2.50 per linear foot; drilling into rock, \$3.50 per linear foot.

Date of contract: April 30, 1907.

Date of beginning: May 15, 1907.

Date of expiration: 25 fair working days.

##### LOCK FOR MOVABLE DAM NO. 11.

Contractor: Aetna Construction Company.

Rate: Grubbing and clearing at \$200 per acre; timber, \$40 per thousand; sheet piling, 50 cents per linear foot; round piling, 40 cents per linear foot; common filling, 30 cents per cubic yard; stone filling, \$2.50 per cubic yard; stone steps, \$1 per linear foot; common excavation, 65 cents per cubic yard; concrete, \$5.35 per cubic yard; white-oak timber, \$60 per thousand; paving, \$5 per cubic

\* Act of March 2, 1907, repealed appropriation of \$135,000 made by act of March 3, 1905, and reappropriated this sum for Lock and Dam No. 26.

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yard; bolt holes, 50 cents per linear foot; iron and steel, 5 cents per pound; cast-iron pipe, 6-inch, \$2 per linear foot; galvanized-iron pipe, 3-inch, \$1 per linear foot; galvanized-iron pipe, 1½-inch, 40 cents per linear foot.

Date of approval: July 11, 1904.

Date of beginning: August 11, 1904.

Date of expiration: December 1, 1907.

MOVABLE DAM NO. 13.

Contractor: The Hollerbach & May Contract Company.

Rate: Common excavation at 65 cents per cubic yard; common filling, 60 cents per cubic yard; stone filling, \$3 per cubic yard; riprap, \$3 per cubic yard; concrete, \$8.10 per cubic yard; oak timber, \$80 per thousand; hemlock timber, \$60 per thousand; decking, \$60 per thousand; sheet piles, 75 cents per linear foot; round piles, 50 cents per linear foot; paving, \$6 per cubic yard; curbing, \$1 per linear foot; drill holes, under 2 inches in diameter, 50 cents per linear foot; pipe and fittings, \$1 per linear foot; reinforcing bars, 5 cents per pound; structural steel, 5 cents per pound; castings, 5 cents per pound; forgings, 5 cents per pound; bolts and miscellaneous iron, 5 cents per pound.

Date of approval: January 20, 1906.

Date of beginning: March 1, 1906.

Date of expiration: 300 fair working days.

SURFACED LUMBER FOR DAM NO. 13.

Contractor: G. Elias & Bro.

Rate: Yellow pine at \$41 per thousand; oak, \$45 per thousand; cypress water-seal strips, 11½ cents per linear foot; wedges, 2 cents each.

Date of approval: April 1, 1907.

Date of beginning: June 3, 1907.

Date of expiration: August 2, 1907.

IRON AND STEEL FOR DAM NO. 13.

Contractor: J. & J. B. Millholland Company.

Rate: Structural steel at 3.21 cents per pound; forgings, 8½ cents per pound; pins, etc., 12 cents per pound; bolts, etc., 3½ cents per pound; steel castings, 10½ cents per pound; iron castings, 7 cents per pound; cast-iron counterweights, 2.28 cents per pound.

Date of contract: March 30, 1907.

Date of beginning: April 19, 1907.

Date of expiration: June 28, 1907. (Time limit waived.)

MOVABLE DAM NO. 18.

Contractor: Baker Contract Company (Incorporated).

Rate: Common excavation at 70 cents per cubic yard; rock excavation, \$3 per cubic yard; common filling, 70 cents per cubic yard; stone filling, \$3 per cubic yard; timber, \$60 per thousand; white-oak timber, \$80 per thousand; yellow pine timber, \$70 per thousand; iron and steel, 7 cents per pound; reinforcing steel, 6 cents per pound; concrete, \$6 per cubic yard; paving, \$6 per cubic yard; curbing, \$1 per linear foot; bolt holes in masonry, 2-inch or less diameter, 50 cents per linear foot; bolt holes in masonry, more than 2-inch diameter, 75 cents per linear foot; galvanized-iron pipe, 1½-inch, 50 cents per linear foot; galvanized-iron pipe, 3-inch, 75 cents per linear foot; galvanized-iron pipe, 4-inch, \$1 per linear foot.

Date of approval: June 3, 1905.

Date of beginning: July 5, 1905.

Date of expiration: 350 fair working days.

PORTLAND CEMENT FOR DAM NO. 18.

Contractor: The Atlas Portland Cement Company.

Rate: In duck sacks at \$1.84 per barrel; in wood, \$1.79 per barrel.

Date of approval: May 2, 1907.

Date of beginning: When notified.

Date of expiration: December 31, 1907.

## IRON AND STEEL FOR DAM NO. 18.

Contractor: Pittsburgh Industrial Iron Works.

Rate: Structural steel at 4.98 cents per pound; forgings, 9 cents per pound; pins, 7½ cents per pound; bolts, etc., 5½ cents per pound; steel castings, 7 cents per pound; iron castings, 4½ cents per pound; bronze cap screws, 30 cents per pound.

Date of approval: May 14, 1907.

Date of beginning: May 26, 1907.

Date of expiration: August 14, 1907.

## COMMERCIAL STATISTICS.

*Freight handled at the wharves of some of the principal cities between Dam No. 8, Ohio River, and Ripley, Ohio, during the calendar year 1906.*

Name of city.	Freight.	Passen- gers.	Name of city.	Freight.	Passen- gers.
	Tons.	Number.		Tons.	Number.
Wellsville, Ohio.....	300	550	Racine, Ohio.....	3,000	2,450
Steubenville, Ohio.....	20,400	10,400	Pomeroy, Ohio.....	3,500	5,000
Glendale, W. Va.....	14,010	.....	Ironton, Ohio.....	10,000	12,000
Parkersburg, W. Va.....	10,000	15,500	Portsmouth, Ohio.....	35,000	20,000

The number of passengers includes excursionists.

The information contained in the foregoing table was obtained through the mayors of the several cities mentioned. It appears that no accurate record is kept of tonnage and passenger traffic at most of the towns on the Ohio River, and the quantities given in the above table are only approximately correct.

## G G 2.

## IMPROVEMENT OF LITTLE KANAWHA RIVER, WEST VIRGINIA.

Owing to the small amount available, nothing was done toward the removal of obstructions above Burning Springs. Funds having been appropriated for this purpose in the act of March 2, 1907, preparations were begun at the close of the fiscal year for clearing the channel of obstructions that had re-formed. This work can only be expeditiously prosecuted during very low water.

Structures, etc., completed under permits from the War Department were inspected to ascertain whether or not the requirements of the permits had been complied with.

One thousand dollars can be profitably expended on the stretch of river above Burning Springs, W. Va., each year in removing obstructions and in maintaining the channel, but to remove the larger obstructions which seriously interfere with navigation will require about \$10,000.

To place Lock and Dam No. 4 in good condition required extensive repairs to both structures. These repairs were begun early in June of 1906, with a small force, and completed November 16. Navigation through the lock was suspended July 14 and was not resumed until October 31.

The repairs to Lock and Dam No. 4 consisted of the following: Grouting, cutting out old masonry from face, pointing, and raising lock walls by placing concrete on top of each wall, repairing gates and operating machinery, and practically rebuilding the dam.

Minor repairs were made to Locks Nos. 1, 2, and 3, so that they would withstand the high water during the winter. No serious damage was done to any of the works.

Preparations were made to begin repairs to Lock and Dam No. 2 and to repair Dam No. 1. Materials were purchased and the plant used at Lock No. 4 transferred to Lock No. 2. It is also proposed to build guide cribs at Locks Nos. 1 and 2, materials for which were contracted for.

A small survey was made of the land required at each site.

The river and harbor act of March 2, 1907, provides for a survey for a lock and dam above No. 5. Preparations for making the survey were completed at the close of the fiscal year.

The commercial statistics for this river are contained in the report for operating and care of locks and dams on Little Kanawha River, West Virginia.

The funds provided by act of March 3, 1905, for repair of Locks and Dams Nos. 1-4 have proven insufficient for the purpose, and it is now estimated that an additional appropriation of \$30,000 will be required to complete the contemplated repair of these structures.

### *Money statements.*

#### ABOVE LOCK NO. 5.

July 1, 1906, balance unexpended.....	\$295. 51
Amount appropriated by river and harbor act approved March 2, 1907..	1, 000. 00
	<hr/> 1, 295. 51
June 30, 1907, amount expended during fiscal year, for maintenance of improvement.....	17. 65
	<hr/> 1, 277. 86
<div style="display: inline-block; vertical-align: middle; font-size: 3em; line-height: 1;">{</div> Amount that can be profitably expended in fiscal year ending June 30, 1909, for maintenance of improvement, in addition to the balance unexpended July 1, 1907.....	1, 000. 00
Submitted in compliance with requirements of sundry civil act of June 4, 1897, and of section 7 of the river and harbor act of 1899.	

#### BELOW LOCK NO. 5.

July 1, 1906, balance unexpended.....	\$81, 298. 73
Amount appropriated by river and harbor act approved March 2, 1907..	79, 500. 00
	<hr/> 160, 798. 73
June 30, 1907, amount expended during fiscal year, for works of improvement.....	40, 137. 62
	<hr/> 120, 661. 11
July 1, 1907, balance unexpended.....	120, 661. 11
July 1, 1907, outstanding liabilities.....	3, 286. 62
	<hr/> 117, 374. 49
July 1, 1907, balance available.....	117, 374. 49
July 1, 1907, amount covered by uncompleted contracts.....	15, 324. 18

#### SURVEY.

Amount appropriated by river and harbor act approved March 2, 1907..	\$500. 00
July 1, 1907, balance unexpended.....	500. 00

## CONSOLIDATED.

July 1, 1906, balance unexpended.....	\$81,594.24
Amount appropriated by river and harbor act approved March 2, 1907..	81,000.00
	<hr/> 162,594.24
June 30, 1907, amount expended during fiscal year:	
For works of improvement.....	\$40,137.62
For maintenance of improvement.....	17.65
	<hr/> .40,155.27
July 1, 1907, balance unexpended.....	122,438.97
July 1, 1907, outstanding liabilities.....	3,283.62
	<hr/> 119,155.35
July 1, 1907, balance available.....	<hr/> 15,324.18
July 1, 1907, amount covered by uncompleted contracts.....	
<hr/>	
{ Amount that can be profitably expended in fiscal year ending June 30, 1909, for maintenance of improvement, in addition to the balance unexpended July 1, 1907.....	
{ Submitted in compliance with requirements of sundry civil act of June 4, 1897, and of section 7 of the river and harbor act of 1899.	
	1,000.00

## APPROPRIATIONS.

August 14, 1876.....	\$7,300	June 3, 1896.....	\$1,500
June 18, 1878.....	18,000	March 3, 1899.....	743
March 3, 1879.....	18,000	June 13, 1902.....	1,000
June 14, 1880.....	15,000	March 3, 1905.....	1,000
March 3, 1881.....	40,000	March 3, 1905.....	163,000
August 2, 1882.....	31,000	March 2, 1907.....	81,000
August 5, 1886.....	16,875		
August 11, 1888.....	25,000		
September 19, 1890.....	40,000	Total.....	459,418

NOTE.—Received from sale, \$186.10.

## CONTRACTS IN FORCE.

## TIMBER FOR DAMS NOS. 1 AND 2.

Contractor: G. Ellas & Bro.  
Rate: Hardwood timber (Lots No. 2) at \$28 per thousand; hardwood timber (Lots No. 3), \$29 per thousand.  
Date of approval: April 22, 1907.  
Date of beginning: June 9, 1907.  
Date of expiration: September 22, 1907.

## TIMBER FOR DAMS NOS. 1 AND 2.

Contractor: The Parkersburg Mill Company.  
Rate: White-oak timber at \$34 per thousand.  
Date of approval: May 3, 1907.  
Date of beginning: June 5, 1907.  
Date of expiration: September 13, 1907.

## SAND AND GRAVEL.

Contractor: Parkersburg and Marietta Sand Company.  
 Rate: Sand at 50 cents per cubic yard; gravel, 50 cents per cubic yard.  
 Date of contract: May 14, 1907.  
 Date of beginning: June 3, 1907.  
 Date of expiration: June 23, 1907. (Time limit waived.)

## TIMBER FOR LOCK NO. 2.

Contractor: G. W. Righter.  
 Rate: White-oak timber at \$30 per thousand.  
 Date of contract: May 22, 1907.  
 Date of beginning: July 1, 1907.  
 Date of expiration: July 31, 1907.

## G G 3.

## OPERATING AND CARE OF LOCKS AND DAMS ON LITTLE KANAWHA RIVER, WEST VIRGINIA.

There is slack-water navigation for a depth of 4 feet, from Parkersburg (the mouth) to Creston, a distance of 48 miles. It consists of five locks and fixed dams, Nos. 1, 2, and 3 of which are in poor condition.

From July 14 to October 31 navigation was suspended through Locks Nos. 4 and 5 on account of the extensive repairs at No. 4. High water and ice interfered with navigation as follows: Lock No. 1, sixty days; Lock No. 2, forty-one days; Lock No. 3, thirty days; Lock No. 4, eighteen days; Lock No. 5, sixteen days. The greater number of days at No. 1 is due to the lock walls being too low. Congress has provided for raising the walls.

The five locks and dams were kept in a serviceable condition throughout the year, except at Lock No. 1, where navigation was interfered with for about nine days, due to the failure of one of the gates. During repairs at Lock No. 4 navigation was suspended for over three months.

*Locks Nos. 1-4.*—The repairs to Locks Nos. 1-3 are being made under the appropriation for improving the Little Kanawha; the repairs to Lock No. 4 under that appropriation were completed. The dam at No. 4 was damaged to a small extent during the high water of January, 1907; the necessary repairs will be made as soon as the river reaches a suitable stage. These locks were operated.

*Lock No. 5.*—The upper and lower gate valves and gates were repaired, and the gates resheeted; and the two lower steps of dam repaired, the lower step being practically rebuilt. Other repairs of a minor character were also made. During the past two winters the dam and guide cribs have been greatly damaged. As the timbers in these structures are decaying rapidly, the rebuilding of the dam and guide cribs will soon be necessary.



## ALLOTMENTS.

November 28, 1891.....	\$1,500.00	July 12, 1902.....	\$2,705.25
July 15, 1892.....	4,426.65	July 20, 1903.....	4,318.97
July 21, 1893.....	3,837.97	March 7, 1904.....	500.00
July 16, 1894.....	3,491.03	July 13, 1904.....	1,931.79
July 20, 1895.....	3,378.17	July 17, 1905.....	1,640.57
July 24, 1896.....	830.72	October 26, 1905.....	3,700.00
July 23, 1897.....	1,684.03	July 19, 1906.....	7,848.21
August 3, 1898.....	3,038.53	October 12, 1906.....	2,000.00
July 21, 1899.....	2,331.58		
July 14, 1900.....	2,271.61	Total.....	54,905.92
June 25, 1901.....	3,470.84		

*Summary of expenditures for operating and care of locks and dams on Little Kanawha River, West Virginia, for the fiscal year ending June 30, 1907.*

Office expenses and superintendence.....	\$1,843.93
Labor.....	3,632.25
Expenses.....	2,116.53
Repairs.....	357.96
Total.....	7,950.67

## COMMERCIAL STATISTICS.

*Commerce that has passed Lock No. 5 for the ten years ending December 31, 1906.*

Year.	Quantity.	Year.	Quantity.
	Tons.		Tons.
1897.....	127,948	1902.....	69,706
1898.....	122,405	1903.....	73,464
1899.....	138,664	1904.....	66,415
1900.....	119,489	1905.....	106,510
1901.....	122,190	1906.....	70,289

*Commerce passing each of the five locks and dams in Little Kanawha River, West Virginia, during the calendar year ending December 31, 1906.*

Articles.	Lock No. 1.	Lock No. 2.	Lock No. 3.	Lock No. 4.	Lock No. 5.
Bricks.....	7	21	40	15	2
Carbon black.....	do.	do.	do.	do.	1,850
Coal.....	177	187	155	121	118
Dry goods.....	84	97	139	68	114
Farm products.....	585	640	530	571	792
Furniture.....	do.	do.	108	50	117
Groceries and paints.....	1,516	1,385	1,612	1,098	1,067
Hardware.....	730	659	738	528	518
Laths.....	2	3	8	6	do.
Live stock.....	92	95	56	24	26
Lumber.....	1,309	1,764	3,500	581	146
Oil-well supplies.....	962	1,325	1,311	1,199	1,892
Salt.....	61	94	95	60	47
Saw logs.....	57,276	54,059	52,883	48,416	38,950
Shooks.....	do.	do.	do.	do.	92
Staves.....	400	270	50	15	do.
Sundries.....	3,778	3,468	2,590	2,650	3,155
Ties, railroad.....	11,385	19,201	15,786	12,691	21,408
Total.....	78,364	83,268	79,601	66,086	70,289
Passengers.....	7,218	6,142	4,092	2,892	9,228

Navigation was suspended in Pools Nos. 4 and 5 from July 15 to November 15, 1906, owing to repairs to Lock and Dam No. 4.

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*List of stern-wheel boats plying on the Little Kanawha River, West Virginia, during calendar year 1906.*

Name of boat.	Length.	Breadth.	Depth.	Tonnage.
	<i>Feet.</i>	<i>Feet.</i>	<i>Feet.</i>	
<b>Steamboats:</b>				
Darling .....	102.0	22.3	4.0	78
Burnadina King .....	99.7	16.6	3.0	50
French .....	104.8	19.9	4.0	82
Excel .....	95.4	14.3	2.8	32
Loma (U. S.) .....	83.0	15.7	4.7	21
Frank Tyler .....	103.0	22.0	3.5	71
Carrie V .....	100.6	19.1	3.1	48
Gazette .....	69.0	15.8	1.8	10
Pioneer City .....	90.4	24.5	8.0	51
<b>Boats propelled by gasoline:</b>				
Clipper .....	59.2	7.0	1.6	6
Albatross .....	67.6	8.7	2.0	9
Reliance .....	65.0	9.8	2.3	12
Calhoun .....	67.6	7.9	1.9	8
Edith H. .....	59.8	9.3	2.1	10
Creston .....	66.3	10.2	2.1	12
Hurricane .....	59.2	7.4	1.5	6
Mable B .....	78.8	7.0	1.6	8
Carbon Black .....	79.0	7.6	1.7	10
H. B. Stout .....	92.4	9.0	2.0	14
Orion .....	50.0	7.5	2.0	6
Winona .....	81.0	8.0	1.8	10
Wabash .....	54.5	8.1	1.9	7
Leone .....	70.0	8.0	2.5	12
Elanora .....	83.0	10.7	2.0	14
Return .....	65.0	9.8	1.9	10
Brooksville .....	42.0	7.5	1.5	
Ethel .....	50.0	7.8	1.7	
Helpe .....	42.0	8.0	1.4	5
Rayman .....	59.0	12.2	2.0	13
Orena L. .....	69.3	9.7	2.0	10
Arthur .....	30.0	5.0	1.4	5
International .....	35.0	8.0	2.0	6
Star .....	35.0	6.0	1.5	2
Swan .....	40.0	8.0	2.0	5
Harry W. .....	55.0	7.0	2.0	10
Big Jeff .....				
Blanch .....				
<b>Pleasure boats:</b>				
Madavera .....	43.0			
Magilla .....	30.0			
Marguerite .....	30.0			
Frances K .....	25.0			
Dauntless .....	25.0			
Lark .....	20.0			
Elizabeth .....	20.0			
Majorie .....	18.5			
Bona .....	18.0			
Helen .....	16.0			
Florence .....	16.0			
Tony .....	16.0			
Zip .....	16.0			
Louise .....				
Welby .....				
Freda .....				
Launch .....				
Meiba .....				
Eleanor .....				

*Report of lockages at Locks Nos. 1-5, Little Kanawha River, West Virginia, for the calendar year ending December 31, 1906.*

	Lock No. 1.	Lock No. 2.	Lock No. 3.	Lock No. 4.	Lock No. 5.
Steamboats .....	721	771	664	564	1,436
Barges and flats .....	472	472	360	274	599
Rafts .....	1,297	1,681	1,543	1,480	1,674
Miscellaneous .....	333	133	107	87	
Total .....	2,823	3,057	2,674	2,356	3,952
Number of lockages .....	2,211	2,631	2,460	2,334	3,352

## G G 4.

## IMPROVEMENT OF KANAWHA RIVER, WEST VIRGINIA.

Under the approved project for the expenditure of the balance remaining from the funds appropriated by the act of June 4, 1897, the following was accomplished: Laid 1,029 feet sewer pipe, 1,550 linear feet walks, and completed the additional buildings and cisterns provided for. About 414 cubic yards of material was handled in grading government land.

High water has interfered with the construction of guide cribs at Lock No. 11. Cassady & Hanna, the contractors for this work, built up the old cribs to the required height and partly filled them with stone, and completed two of the four new cribs, except filling.

The machinery for operating lock gates, etc., with steam at Lock No. 8 was received and partly installed. The original design provides for the use of chain, but it is thought advisable to try wire rope also, as the installation at No. 8 is experimental. Wire rope has been received and the installation will be finished as soon as the conditions are favorable.

As the mouth of the Kanawha is particularly well adapted for an ice harbor, the piers which were built at Point Pleasant to form an ice harbor, and which have become so dilapidated as to make them practically worthless for the purpose, should be rebuilt. It is believed that the piers can be rebuilt at a cost of \$19,000.

Request has been received from those interested in the improvement of this river for the addition of guide walls to the locks for the lower and upper entrances. Such walls would prove a decided benefit to the general navigation of the river.

The commercial statistics for this river are contained in the report for operating and care of locks and dams on Kanawha River.

*Money statement.*

July 1, 1906, balance unexpended.....	\$58,470.12
June 30, 1907, amount expended during fiscal year, for works of improvement .....	8,179.92
July 1, 1907, balance unexpended.....	50,290.20
July 1, 1907, outstanding liabilities.....	240.64
July 1, 1907, balance available.....	50,049.56
July 1, 1907, amount covered by uncompleted contracts.....	7,308.86

## APPROPRIATIONS.

March 3, 1873.....	\$25,000.00	February 1, 1888.....	\$30,370.15
June 23, 1874.....	25,000.00	August 11, 1888.....	350,000.00
March 3, 1875.....	300,000.00	September 19, 1890.....	300,000.00
August 14, 1876.....	270,000.00	July 13, 1892.....	225,000.00
June 18, 1878.....	222,000.00	March 3, 1893.....	500,000.00
March 3, 1879.....	150,000.00	March 2, 1895.....	580,700.00
June 14, 1880.....	200,000.00	June 4, 1897.....	273,000.00
March 3, 1881.....	200,000.00		
August 2, 1882.....	200,000.00	Total.....	4,272,949.45
July 5, 1884.....	200,000.00	Carried to surplus fund.....	1,086.31
August 5, 1886.....	187,500.00		
February 1, 1888.....	34,379.30	Balance.....	4,271,863.14

NOTE.—Received from sales, etc., \$2,257.32.

## G G 5.

OPERATING AND CARE OF LOCKS AND DAMS ON KANAWHA RIVER,  
WEST VIRGINIA.

The slack-water system of the Kanawha River consists of 10 locks and dams, of which 2 are fixed and 8 movable, and provides for 6-foot navigation over a distance of 90 miles from Point Pleasant upstream. As mentioned in previous reports, the cost of maintaining this system is increasing, owing to its length of service. This is especially true at the movable dams, the first of which (Nos. 4 and 5) were completed in 1880, and the last (Nos. 9, 10, and 11) in 1898. At the close of the year the works were practically in good condition.

Navigation on the Kanawha was practically continuous, the only suspension occurring at Locks Nos. 2 and 3. At No. 2 navigation was suspended for twenty-six days on account of high water; at No. 3, twelve days, and two days on account of repairs. Although two unusually severe floods occurred in the Ohio Valley in January and March (gauge reading at Lock No. 11, Kanawha River, 52.85 and 55.55 feet, respectively), the highest stage reached at Charleston during the fiscal year was 33 feet on June 14, 1907.

The movable dams were operated as follows: Dams Nos. 3 and 4, raised 9 and lowered 8 times; Dam No. 5, raised 7 and lowered 6 times; Dams Nos. 7 and 8, raised and lowered 7 times; Dams Nos. 9 and 10, raised 5 and lowered 6 times; Dam No. 11, raised 3 and lowered 4 times.

The following is a summary of the work accomplished:

*Lock No. 2.*—Placed 201 cubic yards of riprap as bank protection below lock, and painted roofs of lock houses.

*Lock No. 3.*—Reset 5 pieces of coping on lock walls and painted roofs of 2 lock houses.

*Lock No. 4.*—Completed repairs to weir of dam and pointed lock walls. New horses for dam were contracted for.

*Lock No. 5.*—Completed repairs to lock gates and cushion timbers of miter sill and pointed part of the lock walls. The middle pier of dam was altered by removing 17 feet of coping from the upper end. Material for repair of weir was received, and new horses for dam contracted for.

*Lock No. 6.*—Replaced old weir trestles with new and relaid 300 feet of brick walk. Received new service boat and placed derrick on it.

*Lock No. 7.*—Renewed cap timbers of lock gates and decks of service boats, rebuilt forge and chimney of blacksmith shop, and painted tin roofs of buildings.

*Lock No. 8.*—Replaced 3 bent weir trestles, 4 weir sill boxes, and 3 horse props and wickets; renewed cap timbers of lock gates and repaired weir service bridge. The old wooden steps leading up the slope at lock were replaced with concrete.

*Lock No. 9.*—Repaired lower guide crib; relaid 32 feet of sewer pipe; replaced 3 weir horses and 2 trestles, 42 chains and 5 cushion blocks, and began repairs to lock gates. Painted tin roofs of 4 houses.

*Lock No. 10.*—Rebuilt foundation, forge, and chimney of blacksmith shop; replaced old wooden steps with concrete; repaired lower

guide crib; replaced 4 cushion timbers of weir, and painted the roofs of 4 houses.

*Lock No. 11.*—Replaced 82 trestle chains; placed 10 check posts on lock walls and guide cribs; replaced 1 gate spar, and painted tin roofs of 8 buildings.

Where needed, the buildings, boats, irons of locks and dams, etc., were painted, the interior of some of the lock houses papered, and fences and outbuildings whitewashed. Many repairs of a minor character were made by the regular force at the locks.

A contract was entered into for building 8 lock houses, with outbuildings. Work was commenced June 10. Contracts were also entered into for steel horses for dams, timber, lumber, paint stuffs, stone, etc., required in making repairs. The contract for stone entered into with James R. Bell was annulled, the contractor having failed to make satisfactory delivery.

*United States telephone line.*—The line, which extends from Kana-wha Falls to Lock No. 11, was kept in good repair. Old poles were replaced and reset where needed. An expert lineman made a thorough examination of the line and instruments at the different stations. The exclusive use of dry batteries during the year has resulted in more uniform and better service.

U. S. dredge *Addison* removed 19,722 cubic yards of material, 68 stones, and 33 snags from the river. The usual annual repairs were made.

U. S. towboat *James Rumsey* was employed as tender to the dredge, and also in transporting materials, etc., for repairs. The towboat assisted in making repairs at Lock No. 5, and removed 23 snags, etc., 30 stones, and 1 broken trestle. The boat was thoroughly overhauled and the hull scraped and painted.

U. S. launch *Mascot* was used in making inspections of work and transporting employees and material for repairs.

## ALLOTMENTS.

For fiscal year 1885.....	\$7,075.00	April 10, 1900.....	\$1,400.00
For fiscal year 1886.....	8,710.00	July 13, 1900.....	49,444.47
July 8, 1886.....	11,170.00	July 3, 1901.....	47,506.31
June 17, 1887.....	13,289.00	May 16, 1902.....	2,500.00
February 4, 1888.....	3,549.70	June 23, 1902.....	9,500.00
August 16, 1888.....	19,990.02	July 17, 1902.....	52,859.86
July 11, 1889.....	19,261.61	July 14, 1903.....	61,946.86
July 16, 1890.....	25,702.27	July 15, 1904.....	60,770.71
October 9, 1890.....	3,400.00	July 17, 1905.....	53,740.86
July 14, 1891.....	19,453.00	July 20, 1906.....	103,726.10
July 6, 1892.....	21,891.64		
July 12, 1893.....	24,549.41	Total.....	831,418.21
July 10, 1894.....	30,600.00	Withdrawn:	
July 2, 1895.....	30,200.00	Fiscal year	
July 25, 1896.....	37,082.59	1888.....	\$2,049.70
August 2, 1897.....	22,700.77	Fiscal year	
July 26, 1898.....	36,331.90	1890.....	.01
September 29, 1898.....	2,650.00		2,049.71
June 2, 1899.....	14,000.00		
August 2, 1899.....	36,416.13	Balance.....	829,368.50

# 1752 REPORT OF THE CHIEF OF ENGINEERS, U. S. ARMY.

*Summary of expenditures for operating and care of locks and dams on Kanawha River, West Virginia, for the fiscal year ending June 30, 1907.*

Office expenses and superintendence.....	\$9, 101. 73
Labor .....	43, 631. 96
Fuel .....	908. 02
Expenses .....	806. 95
Repairs .....	11, 700. 91
Total.....	66, 149. 57

## CONTRACTS IN FORCE.

### GUIDE CRIBS AT LOCKS NOS. 2, 3, AND 11.

Contractors: R. B. Cassady and W. H. Hanna.

Rate: At Locks Nos. 2 and 3—excavation at 65 cents per cubic yard; embankment, 50 cents per cubic yard; stone filling, \$1.25 per cubic yard; timber, \$40 per thousand; driftbolts, 2½ cents per pound. At Lock No. 11—excavation, 80 cents per cubic yard; embankment, 50 cents per cubic yard; stone filling, \$1.25 per cubic yard; timber, \$40 per thousand; driftbolts, 2½ cents per pound.

Date of approval: September 7, 1904.

Date of beginning: October 9, 1904.

Date of expiration: 450 days, Sundays and legal holidays excepted. (Time limit waived.)

### STEEL HORSES FOR DAMS NOS. 4 AND 5.

Contractor: Frank Woodman.

Rate: Steel horses at 5½ cents per pound.

Date of approval: December 31, 1906.

Date of beginning: January 23, 1907.

Date of expiration: July 22, 1907.

### TIMBER, LUMBER, ETC.

Contractor: The Charleston Lumber Company.

Rate: Red-cedar shingles at \$5 per thousand; oak flooring, \$45 per thousand; pine ceiling, \$30 per thousand; bevel siding, \$25 per thousand; drop siding, \$37.50 per thousand; baseboard, 5 cents per linear foot; water table, 1½ cents per linear foot; quarter-round mold, ½ cent per linear foot; sash lining, ½ cent per linear foot; poplar, dressed two sides, \$60 per thousand; pine, \$60 per thousand; hemlock, \$20 per thousand; hemlock sheathing, No. 2, dressed one side, \$20 per thousand; white oak, \$40 per thousand; white oak, dressed two sides, \$45 per thousand; pine or poplar, \$60 per thousand; pine or poplar, dressed two sides, \$60 per thousand.

Date of contract: April 8, 1907.

Date of beginning: June 7, 1907.

Date of expiration: August 6, 1907.

### LOCK HOUSES, ETC.

Contractor: Volney E. Taylor.

Rate: Lock house, with outbuildings, at Lock No. 4, at \$3,570; lock house, with outbuildings, at Lock No. 5, \$3,390; lock house, with outbuildings, at Lock No. 6, \$3,380; lock house, with outbuildings, at Lock No. 7, \$3,380; lock house, with outbuildings, at Lock No. 8, \$3,500; lock house, with outbuildings, at Lock No. 9, \$3,520; lock house, with outbuildings, at Lock No. 10, \$3,450; lock house, with outbuildings, at Lock No. 11, \$3,520; for masonry over that shown in plan, \$8.35 per cubic yard.

Date of approval: June 4, 1907.

Date of beginning: July 5, 1907.

Date of expiration: 300 fair working days.

## COMMERCIAL STATISTICS.

*Statement of number of tons of coal, including that manufactured into coke, shipped by river from mines on the Kanawha below Kanawha Falls for the ten years ending December 31, 1906.*

Year.	Quantity.	Year.	Quantity.
	<i>Tons.</i>		<i>Tons.</i>
1897 .....	650,680	1902 .....	937,880
1898 .....	1,089,160	1903 .....	1,333,920
1899 .....	942,800	1904 .....	1,094,700
1900 .....	1,240,680	1905 .....	1,460,680
1901 .....	1,370,180	1906 .....	1,176,300

*Tonnage of the Kanawha River for the calendar year ending December 31, 1906.*

Articles.	Quantity.	Tonnage.
Coal.....bushels..	29,407,500	1,176,300
Coke.....tons..		500
Timber.....feet B. M.	19,430,000	84,002
Staves, oak.....number..	183,000	1,372
Bark and wood for tanning.....cords..	631	1,230
Hoop poles.....number..	531,000	1,327
Laths.....do..	1,942,000	1,888
Railroad ties, oak.....do..	845,400	36,842
Shingles.....do..	435,000	78
Bricks.....do..	686,000	1,560
Salt.....barrels..	5,560	782
Merchandise and produce in steamboats.....tons..		73,297
Total.....		1,327,708

*Total tonnage of the Kanawha River for the ten years ending December 31, 1906.*

Year.	Quantity.	Year.	Quantity.
	<i>Tons.</i>		<i>Tons.</i>
1897 .....	832,002	1902 .....	1,090,797
1898 .....	1,244,334	1903 .....	1,506,043
1899 .....	1,124,364	1904 .....	1,233,158
1900 .....	1,475,980	1905 .....	1,618,889
1901 .....	1,547,610	1906 .....	1,327,708

*Commerce passing each of the ten locks and dams in Kanawha River, West Virginia, during the calendar year ending December 31, 1906.*

Articles.	Lock No. 2.	Lock No. 3.	Lock No. 4.	Lock No. 5.	Lock No. 6.
Coal.....bushels..	798,000	2,929,500	6,409,500	11,130,000	17,697,000
Coke.....tons..	500	500	500	500	500
Lumber, etc.....feet..	423,700	560,665	627,400	749,000	2,455,900
Shingles.....number..	14,000	82,500	68,500	41,000	201,750
Laths.....do..	650			3,000	182,900
Bricks.....do..	2,400	22,000	43,130	58,500	268,150
Miscellaneous freight.....tons..	4,910	5,799	11,280	14,680	87,184
Salt.....barrels..	59	187	261	420	3,538
Railroad ties.....number..					88,300
Staves.....do..					21,000
Hoop poles.....do..					212,550
Bark.....cords..					87
Steamboats.....number..	1,151	1,256	1,481	1,611	2,098
Coal barges.....do..	116	439	945	1,626	2,505
Other craft.....do..	62	111	108	185	188
Lockages.....do..	1,124	1,465	758	858	1,286
Dams up.....days..			131	144	172
Passengers.....number..	6,285	7,763	12,260	13,783	35,114

# 1754 REPORT OF THE CHIEF OF ENGINEERS, U. S. ARMY.

*Commerce passing each of the ten locks and dams in Kanawha River, West Virginia, etc.—Continued.*

Articles.	Lock No. 7.	Lock No. 8.	Lock No. 9.	Lock No. 10.	Lock No. 11.
Coal.....bushels.....	18,533,000	24,771,800	28,826,700	28,890,300	28,966,800
Coke.....tons.....	500	500	500	500	500
Lumber, etc.....feet.....	3,430,909	4,983,449	4,415,172	5,689,082	6,222,674
Shingles.....number.....	318,500	416,500	190,000	186,000	269,000
Laths.....do.....	1,569,500	1,414,000	1,821,100	1,787,400	1,779,025
Bricks.....do.....	336,600	297,600	453,400	333,900	582,225
Miscellaneous freight.....tons.....	38,500	39,245	41,348	38,989	40,692
Salt.....barrels.....	4,020	3,474	3,150	2,941	2,927
Railroad ties.....number.....	104,000	218,950	282,650	256,200	345,400
Staves.....do.....	62,000	25,000	85,000	35,000	183,000
Hoop poles.....do.....	261,425	367,975	491,300	470,925	530,925
Bark.....cords.....					100
Steamboats.....number.....	2,009	2,426	2,271	2,339	2,445
Coal barges.....do.....	2,620	3,933	4,640	4,609	4,561
Other craft.....do.....	299	186	280	202	297
Lockages.....do.....	1,153	1,849	1,417	1,240	987
Dams up.....days.....	161	175	159	143	116
Passengers.....number.....	30,222	28,936	22,763	22,834	24,553

*List of steamboats plying Kanawha River, West Virginia, for the calendar year 1906.*

[All stern-wheel, except as noted.]

Name of boat.	Character.	Length.	Breadth.	Depth.	Tonnage.
		<i>Feet.</i>	<i>Feet.</i>	<i>Feet.</i>	
Greenlands.....	Packet.....	204.4	31.9	5.4	294
Tacoma.....do.....	.....	182.3	32.4	5.0	276
Kanawha.....do.....	.....	180.6	35.2	5.2	429
Henry M. Stanley.....do.....	.....	180.0	32.4	5.5	298
Greenwood.....do.....	.....	168.5	30.0	4.4	270
Columbia.....do.....	.....	156.0	24.2	4.0	197
J. Q. Dickinson.....do.....	.....	135.5	24.5	5.1	143
Cricket.....do.....	.....	132.6	18.3	2.9	65
Argand.....do.....	.....	132.6	24.0	5.0	96
Calvert.....do.....	.....	122.0	20.2	4.0	110
Baxter.....do.....	.....	121.0	22.4	3.6	75
Gondola.....do.....	.....	120.2	23.0	3.2	99
Evergreen.....do.....	.....	119.5	22.5	3.5	99
Neva.....do.....	.....	117.0	21.6	3.4	71
Carbon Black.....do.....	.....	79.0	7.6	1.7	10
Genevieve.....do.....	.....	59.9	11.9	2.6	14
Cuba.....do.....	.....	50.0	9.6	2.5	10
Florence Marmet.....	Towboat.....	155.0	30.8	5.0	263
A. M. Scott.....do.....	.....	150.0	26.0	5.0	168
Robert P. Gillham.....do.....	.....	149.5	31.5	4.3	158
J. T. Hatfield.....do.....	.....	143.0	28.8	5.6	198
J. B. Lewis.....do.....	.....	141.5	26.0	4.4	162
Catherine Davis.....do.....	.....	135.6	26.5	4.0	334
Lucie Marmet.....do.....	.....	134.8	28.7	4.8	185
Val P. Collins.....do.....	.....	132.6	24.6	4.8	119
Crown Hill.....do.....	.....	132.4	26.0	4.6	366
D. T. Lane.....do.....	.....	129.0	24.0	4.0	146
Otto Marmet.....do.....	.....	128.6	25.7	4.5	135
Douglas Hall.....do.....	.....	127.5	27.2	4.3	122
Vernie Mac.....do.....	.....	127.0	24.7	4.9	122
Clerimond.....do.....	.....	124.0	23.2	3.9	87
Mountain State.....do.....	.....	122.0	29.6	5.0	142
Conquest.....do.....	.....	121.0	23.5	3.9	209
Winifrede.....do.....	.....	119.4	24.9	4.6	97
W. B. Calderwood.....do.....	.....	112.0	24.5	4.6	85
Salie Marmet.....do.....	.....	109.3	20.6	4.0	51
French.....do.....	.....	104.8	19.9	4.0	82
Darling.....do.....	.....	102.0	22.3	4.0	78
Scout.....do.....	.....	101.1	20.6	3.5	77
Antoinette.....do.....	.....	100.7	19.9	3.9	64
Mary Stewart.....do.....	.....	100.0	24.3	3.4	77
Katie Mc.....do.....	.....	98.1	18.0	2.8	41
Telephone.....do.....	.....	93.0	15.0	2.4	73
Nellie England.....do.....	.....	92.0	18.0	3.4	85
Vivian.....do.....	.....	90.0	21.0	3.5	75
Levi Leoti.....do.....	.....	90.0	18.4	3.0	75
Dan Patch.....do.....	.....	81.8	16.5	3.6	28
M. L. Thornton.....do.....	.....	73.6	14.0	2.6	26
Mountain Queen.....do.....	.....	54.8	15.0	2.5	13



*List of steamboats plying Kanawha River, West Virginia, etc.—Continued.*

Name of boat.	Character.	Length.	Breadth.	Depth.	Tonnage.
		<i>Fect.</i>	<i>Fect.</i>	<i>Fect.</i>	
Florinel .....	Towboat .....	47.5	8.7	2.6	11
Hustler .....	do .....	45.8	11.0	1.9	8
Arlona May .....	do .....	40.5	9.0	2.0	6
J. P. Lightner .....	do .....	40.0	12.6	3.0	8
James Rumsey <sup>b</sup> .....	U. S. towboat .....	120.0	22.0	4.3	125
Golden Rod .....	U. S. L. H. tender .....	150.0	26.5	3.7	150
Mascot <sup>b</sup> .....	U. S. launch .....	61.0	8.1	2.4	7
Billy Martin <sup>b</sup> .....	Pump and harbor .....	89.0	14.3	4.0	28
Iron Duke <sup>b</sup> .....	do .....	88.0	13.5	3.7	30
Thelma <sup>b</sup> .....	Launch .....				
Loon .....	do .....				
Prentiss Farley <sup>b</sup> .....	do .....				
Virginia <sup>b</sup> .....	do .....				
Will H. Stone .....	do .....				
Ida May <sup>b</sup> .....	do .....				
Janice <sup>b</sup> .....	do .....				
Laura <sup>b</sup> .....	do .....				
Little Bill .....	do .....				
Van M. .....	do .....				
St. Albans .....	do .....				
Skiddo <sup>b</sup> .....	do .....				
Shamrock .....	do .....				
Gernot <sup>b</sup> .....	do .....				
Iron Queen <sup>b</sup> .....	do .....				
Bertha <sup>b</sup> .....	do .....				
Lulu <sup>b</sup> .....	do .....				
Wizard <sup>b</sup> .....	do .....				
Anantha <sup>b</sup> .....	do .....				
Mountain Girl <sup>b</sup> .....	do .....				
Polly <sup>b</sup> .....	do .....				
Anna <sup>b</sup> .....	do .....				
Clara O. <sup>b</sup> .....	do .....				
Edith May <sup>b</sup> .....	do .....				
Dart <sup>b</sup> .....	do .....				
Odesimus <sup>b</sup> .....	do .....				
Maud <sup>b</sup> .....	do .....				
Real Thing <sup>b</sup> .....	do .....				
Lizzie D. <sup>b</sup> .....	do .....				
Mary of Egypt .....	Sailboat .....				
Uncle Sam .....	do .....				

<sup>a</sup> Side-wheel.

<sup>b</sup> Screw propeller.

Where no dimensions are given the boats are not registered, being small naphtha or gasoline launches.



## APPENDIX H H.

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IMPROVEMENT OF MUSKINGUM RIVER, OHIO; OF BIG SANDY RIVER,  
AND ITS FORKS, WEST VIRGINIA AND KENTUCKY, AND OF KEN-  
TUCKY RIVER, KENTUCKY.

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REPORT OF MAJ. J. G. WARREN, CORPS OF ENGINEERS, OFFICER IN  
CHARGE, FOR THE FISCAL YEAR ENDING JUNE 30, 1907.

### IMPROVEMENTS.

- |   |  |
|---|--|
| 1. Muskingum River, Ohio.   | 5. Kentucky River, Kentucky.   |
| 2. Operating and care of locks and<br>dams on Muskingum River, Ohio.                          | 6. Operating and care of locks and<br>dams on Kentucky River, Ken-<br>tucky. |
| 3. Big Sandy River and Levisa and<br>Tag forks, West Virginia and<br>Kentucky.                |  |
| 4. Operating and care of locks and<br>dams on Big Sandy River, West<br>Virginia and Kentucky. |  |
- 

ENGINEER OFFICE, UNITED STATES ARMY,  
*Cincinnati, Ohio, July 10, 1907.*

GENERAL: I have the honor to submit herewith the annual reports  
of the works under my charge for the year ending June 30, 1907.

Very respectfully,

J. G. WARREN,  
*Major, Corps of Engineers.*

Brig. Gen. A. MACKENZIE,  
*Chief of Engineers, U. S. A.*

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### H H 1.

#### IMPROVEMENT OF MUSKINGUM RIVER, OHIO.

The natural condition of this work and projects for its improve-  
ment are described and references for more extended information are  
given in the current summary.

## OPERATIONS DURING THE FISCAL YEAR.

*Lock and Dam No. 11.*—The land required for this site was purchased and staked off, plans and specifications drawn, and work under contract with Mr. E. J. Landor, of Canton, Ohio, dated April 4, 1907, for constructing the lock, dam, and accessories was commenced in June, 1907, and is in progress at the close of the year.

The work done under this contract was 210 cubic yards of earth excavation, at 60 cents per cubic yard.

The amount expended during the year was \$1,926.71.

*Lock No. 10.*—Work under contract with Mr. C. O. Waxler, of Philo, Ohio, dated March 28, 1907, for constructing a lockmaster's dwelling and storehouse combined, was commenced in April, 1907, and is in progress at the close of the year. Under this contract the foundation of the building was completed and the cellar door and window frames placed in position.

The amount expended during the year was \$105.

*Dam No. 3.*—The work of raising the crest of the dam 1 foot in timber was completed in September, 1906.

The amount expended during the year was \$609.37.

Commercial statistics are reported under the head of "Operating and care," etc.

*Money statement.*

July 1, 1906, balance unexpended.....	\$114, 801. 30
Received from other sources.....	19. 25
Amount appropriated by river and harbor act approved March 2, 1907	48, 000. 00
	<hr/>
	162, 820. 55
June 30, 1907, amount expended during fiscal year, for works of improvement.....	2, 641. 08
	<hr/>
July 1, 1907, balance unexpended.....	160, 179. 47
July 1, 1907, outstanding liabilities.....	115. 60
	<hr/>
July 1, 1907, balance available.....	160, 063. 87
	<hr/>
July 1, 1907, amount covered by uncompleted contracts.....	140, 359. 00

## APPROPRIATIONS.

August 11, 1888.....	\$102, 000. 00
July 1, 1898.....	6, 000. 00
June 13, 1902.....	10, 300. 00
March 3, 1905.....	118, 000. 00
March 2, 1907.....	48, 000. 00
	<hr/>
	284, 300. 00
Received from other sources.....	258. 62
	<hr/>
Total .....	284, 558. 62

## CONTRACTS IN FORCE.

## CONTRACT FOR BUILDING LOCK AND DAM NO. 11, AND ACCESSORIES, MUSKINGUM RIVER, OHIO.

Name of contractor: Edward J. Landor.

Date of approval: April 16, 1907.

Date of beginning: April 26, 1907.

Date of expiration: December 31, 1908.

Item.	Contract price (unit rate).
Earth excavation .....	cubic yard.. \$0.60
Rock excavation .....	do. 2.00
Embankment .....	do. 0.60
Concrete .....	do. 7.00
Iron and steel .....	pounds.. 0.07½
Riprap, placed .....	cubic yard.. 1.00
Riprap, furnished and placed .....	do. 1.50
Timber .....	M. feet B. M. 40.00
Piling .....	linear foot. 0.35
Dwellings .....	each 3,250.00
Outbuildings .....	do. 250.00
Office building .....	do. 400.00
Cisterns .....	each 130.00

## CONTRACT (EMERGENCY) FOR BUILDING LOCK-MASTER'S DWELLING AND STOREHOUSE COMBINED, AT LOCK NO. 10.

Name of contractor: C. O. Waxler.

Date of approval: (Emergency contract.)

Date of beginning: April 7, 1907.

Date of expiration: On or before October 31, 1907.

Item.	Contract price.
For the construction of 1 lock-master's dwelling and storehouse combined, at Lock No. 10, Muskingum river, Ohio.....	\$4,719.00

## H H 2.

## OPERATING AND CARE OF LOCKS AND DAMS ON MUSKINGUM RIVER, OHIO.

Under an allotment from the indefinite appropriation for operating and care of canals and other works of navigation there has been expended during the year \$68,572.49.

The system comprises 10 locks with fixed dams and 4 short lateral canals aggregating 2½ miles in length. The canal at Dam No. 9, 1 mile in length, although not now needed for navigation, is maintained to furnish water power and to supply water needed for docking purposes in the old lock at its lower end.

Navigation was suspended on account of high water for a period of nineteen days, from January 19 to 25, and from March 13 to 24, 1907, and at Lock No. 7 from October 2 to 11, 1906, for repairing guard gates at head of canal.

Permits for work by private persons and corporations have been granted by the Secretary of War during the year as follows:

*Permits.*

Date.	Name.	For what purpose.
1907.		
Mar. 5..	Waters Eclipse Laundry Company, Zanesville, Ohio.	To lay a 2-inch water pipe from its building on Water street to the United States lateral canal at Zanesville, Ohio.
May 11..	City of Zanesville, Ohio.....	To construct and maintain a sewer outlet into the United States lateral canal at the foot of Seventh street, Zanesville, Ohio.

The following work, in addition to the ordinary lock operation, was done during the year:

*Lock No. 1.*—Overhauled and repaired the operating machinery of head gates of mill race. Refilled and regraded a 35-foot section of river bank back of right abutment of dam. Constructed a metal service bridge 23 feet long across mill race back of lock for use in operating the head gates. Replaced ten unserviceable valve stems on the middle gates of lock. Purchased timber for use in replacing decayed parts of the upper gates of lock.

*Lock No. 2.*—Reconstructed above pool level 25 feet in length of the wooden guard crib above lock. Purchased the timber for repairs to apron of dam.

*Lock No. 3.*—Repaired damaged bank protection at the left end of dam with 50 cubic yards of stone. Repaired valve in river wall of lock. Made minor repairs to lockmaster's dwelling and storehouse, and replaced on its foundation storehouse and waiting room, which had been carried off by high water.

*Lock No. 4.*—The work under contract with Clifton Brothers, of Zanesville, Ohio, dated December 26, 1906, for reconstructing in concrete the conduit leading from the canal above the lock to the mill race below and the guide and guard cribs below the lock was commenced April 1, 1907, and is in progress at the close of the year. The items of work done under this contract are as follows:

*Conduit.*

Excavation, 1,520 cubic yards, at 50 cents per cubic yard.

Filling, 1,000 cubic yards, at 40 cents per cubic yard.

Lumber, 11,000 feet B. M., at \$50 per M feet B. M.

Concrete, 525 cubic yards, at \$6.80 per cubic yard.

*Cribs.*

Excavation, 262 cubic yards, at 50 cents per cubic yard.

The amount expended for this work during the fiscal year was \$1,628.82.

Overhauled and repaired the operating machinery of lock gates.

*Lock No. 5.*—Made minor repairs to foundation of storehouse.

*Lock No. 6.*—Nothing was done under the contract with Clifton Brothers, of Zanesville, Ohio, dated April 8, 1907, for reconstructing in concrete two guard cribs above the lock except preliminary work and the delivery of material.

*Lock No. 7.*—Removed the left guard gate at head of canal; cleared heavy mud deposits from floor in the guard gates; filled with concrete a cavity under the pintle step of gate; rebuilt the pintle step and replaced the gate; constructed and placed new cast-iron bonnet and repaired gate anchorage. For this purpose a cofferdam was constructed and the canal unwatered.

Rebuilt above pool level the upper gates of lock. Renewed the decayed sheeting of lower river gate. Replaced with concrete the timber foundation of wood planer and workshop. The construction of a concrete sidewalk along store yard and walk leading from street to storehouse, under contract with James Ramsey of McConnelsville, Ohio, dated May 22, 1907, was completed June 17, 1907.

Constructed with concrete revetment of canal bank below draw-bridge.

Most of the timber and lumber used in the repair work throughout the system, including the reconstruction and repairs to the floating plant, was planed and prepared in the workshop located at this lock.

One hundred and sixty feet in length of the wooden guide crib below lock was repaired and raised 5 feet. The following material was expended in this work:

Timber.....feet B. M. 20,000  
Driftbolts .....pounds 3,600

Refilled 58 cubic yards of earth over terreplein of lock and resodded the area filled.

*Lock No. 9.*—The work under contract with Clifton Brothers, of Zanesville, Ohio, dated August 17, 1906, for reconstructing in concrete 617 feet in length of the dam was completed June 11, 1907. The items of work done under this contract were as follows:

Classification.	Quantities.	Unit price.	Amount.
Excavation.....cubic yards.....	3,050	\$0.80	\$1,830.00
Timber.....feet B. M.....	36,260	30.00	1,087.80
Stone.....cubic yards.....	440	.30	132.00
Concrete.....do.....	4,300	4.90	21,070.00
Total.....			24,119.80

The timber and metal work required for reconstructing the lower and the upper gates of the old Lock No. 9 were received at the workshop at Lock No. 7; the timbers were planed and framed and the work of assembling the upper gates was in progress at the close of the year.

The work under contract with Clifton Brothers, of Zanesville, Ohio, dated April 8, 1907, for reconstructing in concrete the revetment of canal embankment and guard crib above lock was commenced in May, 1907, and is in progress at the close of the year. The item of work done under this contract is as follows:

One hundred cubic yards excavation at 90 cents per cubic yard.

With a view to making permanent repairs to the canal embankment for the purpose of furnishing the water power with which the United States is charged, some minor work was done, consisting in removing about 100 cubic yards of material washed in against the head gate of conduit leading from the canal; constructing a temporary bulk-

head across the upper end of old lock; refilling 885 cubic yards of material over eroded and damaged embankment of canal; and replacing riprap protection of the embankment overlying the conduit.

*Lock No. 10.*—Rebuilt above pool level the lower gates and renewed decayed timbers of middle gates of lock.

Under contract with Clifton Brothers, of Zanesville, Ohio, dated April 8, 1907, for reconstructing in concrete the revetment of canal embankment, no work was done.

Refilled 43 cubic yards of earth over the eroded embankment of the canal.

Extra labor was employed throughout the year to assist the lock force in clearing the lock walls of ice, the lock chambers and lock gates from sedimentary deposits, and mowing and cleaning the canal embankments.

The U. S. dredge *Malta* was usefully employed throughout the working season of 1906 in dredging out the canals, approaches to locks, and shoals in the pools and back of dams, removing snags and other obstructions. The total number of cubic yards excavated was 58,798, at an average cost of \$0.09207 per cubic yard. The dredge was attended by the hired steamers *French* and *Clerimond*, under contract with Lewis Pope & Sons, of Parkersburg, W. Va., dated August 29, 1906, from September 4 to December 4, 1906, a total of seventy-eight days, at \$30 per day. During the remainder of the season the U. S. steamer *Vega* served as tender. The renewal of this dredge was accomplished by constructing a hull and cabin complete and transferring the equipment and machinery from the old to the new boat. Many of the worn-out and unservicable fixtures of the dredge were replaced.

The U. S. steamer *Vega* was employed as dredge tender during a part of the working season and in towing material required for repair work accomplished by hired labor. Repairs were made to her boilers, engines, hull, and upper works.

Under date of June 15, 1907, a contract was entered into with the Howard Ship Yards Company, of Jeffersonville, Ind., for the construction of a new towboat, the contract price being \$14,400.

The floating pile driver and derrick boat was employed in constructing a cofferdam across the canal at Lock No. 7, making repairs to guard gates at Lock No. 7, and the lock gates at Lock No. 10, and in the reconstruction of the dredge *Malta*. The gunwales and rake planking of the vessel were recalked and minor repairs were made.

Lumber was purchased for the reconstruction of a barge

*Establishment of harbor lines at Zanesville, Ohio.*—This work is in progress at the close of the year. The two lines above Dam No. 10, as tentatively determined at public hearings, aggregating 17,100 feet in length, have been definitely established on the ground, together with all reference points practicable.

*Summary of expenditures for operating and care of locks and dams on Muskingum River, Ohio, for the fiscal year ending June 30, 1907.*

Services .....	\$31,214.66
Supplies .....	809.52
Materials .....	31,014.64
Fuel .....	697.93
Miscellaneous .....	4,835.74
<b>Total .....</b>	<b>68,572.49</b>



## ALLOTMENTS.

Appropriated August 5, 1886.....	\$20,000.00
Allotted—	
July 21, 1887.....	190,000.00
August 13, 1888.....	177,623.00
July 1, 1889.....	232,080.00
July 19, 1890.....	195,665.00
May 28, 1891.....	20,000.00
July 8, 1891.....	155,200.00
November 9, 1891.....	39,980.00
November 24, 1891.....	1,200.00
December 9, 1891.....	1,200.00
January 5, 1892.....	12,241.54
August 3, 1892.....	42,919.47
July 22, 1893.....	52,745.36
July 25, 1894.....	47,157.66
July 12, 1895.....	29,971.20
July 24, 1896.....	41,337.10
July 23, 1897.....	43,527.50
July 23, 1898.....	35,950.58
July 25, 1899.....	44,954.30
October 16, 1899.....	1,500.00
July 14, 1900.....	44,921.96
June 25, 1901.....	38,251.42
July 25, 1902.....	47,576.72
July 10, 1903.....	50,358.37
July 11, 1904.....	54,000.75
July 21, 1905.....	47,914.68
July 21, 1905, received from city of Zanesville, Ohio, for dredging.....	210.00
September 28, 1905.....	4,200.00
May 28, 1906.....	24,000.00
July 28, 1906.....	60,365.91
March 30, 1907, by sale of blueprints.....	1.50
Total.....	1,757,054.02

## SPECIAL WORK AUTHORIZED BY ACT OF CONGRESS.

Allotted—	
March 21, 1895, protection wall at Zanesville.....	\$1,651.00
June 17, 1895, pier of railroad bridge at Marietta.....	10,449.60
June 17, 1895, pier of county bridge at Taylorsville.....	5,834.20
Total.....	17,934.80

## CONTRACTS IN FORCE.

CONTRACT FOR RECONSTRUCTING, IN CONCRETE, ABOUT 617 FEET IN LENGTH OF DAM NO. 9, MUSKINGUM RIVER, OHIO.

Name of contractor: Clifton Brothers.

Date of approval: August 27, 1906.

Date of beginning and date of expiration: Within ten days after date of notification of approval of contract and be completed within one hundred fair working days after date of commencement.

Items.	Contract price (unit rate).
Excavation.....cubic yard.....	\$0.60
Timber.....M. feet B. M.....	30.00
Stone.....cubic yard.....	.80
Concrete.....do.....	4.90

Completed.

# 1764 REPORT OF THE CHIEF OF ENGINEERS, U. S. ARMY.

## CONTRACT FOR SERVICES OF TOWBOAT TO SERVE AS DREDGE TENDER.

Name of contractor: Lewis Pope & Sons.

Date of approval: (Emergency contract.)

Date of beginning and date of expiration: When ordered.

Item.	Contract price (unit rate).
For furnishing towboat and crew for service in connection with the United States dredge.....per day..	\$30.00

Completed.

## CONTRACT (EMERGENCY) FOR CONSTRUCTING ABOUT 1,500 SQUARE FEET OF CONCRETE SIDEWALK AT LOCK NO. 7.

Name of contractor: James Ramsey.

Date of approval: (Emergency contract.)

Date of beginning and date of expiration: Within ten days after date of signature to contract and to be completed on or before June 30, 1907.

Item.	Contract price (unit rate).
For constructing, in concrete, about 1,500 square feet of sidewalk .....square foot..	\$0.124

Completed.

## CONTRACT FOR RECONSTRUCTING, IN CONCRETE, CONDUIT, GUIDE, AND GUARD CRIBS AT LOCK NO. 4, MUSKINGUM RIVER, OHIO.

Name of contractor: Clifton Brothers.

Date of approval: January 14, 1907.

Date of beginning and date of expiration: Within ten days after date of notification of approval of contract, and be completed on or before June 30, 1907.

Items.	Contract price (unit rate).
<i>Conduit.</i>	
Excavation.....cubic yard..	\$0.50
Filling.....do...	.40
Lumber.....M. feet B. M...	50.00
Concrete.....cubic yard..	6.80
<i>Cribs.</i>	
Excavation.....cubic yard..	.50
Filling.....do...	.40
Lumber.....M. feet B. M...	40.00
Concrete.....cubic yard..	5.50

## CONTRACT FOR RECONSTRUCTING, IN CONCRETE, THE REVETMENT OF CANAL EMBANKMENTS AT LOCKS NOS. 9 AND 10, AND GUARD CRIBS AT LOCKS NOS. 6 AND 9.

Name of contractor: Clifton Brothers.

Date of approval: (Emergency contract.)

Date of beginning and date of expiration: Within ten days after date of signature of contract, and be completed on or before October 31, 1907.

Items.	Contract price (unit rate).
<i>Work at Lock No. 6.</i>	
Excavation.....cubic yard..	\$0.60
Concrete.....do.....	7.00
Piling.....linear foot.....	.60
<i>Work at Lock No. 9.</i>	
Excavation.....cubic yard..	.90
Concrete.....do.....	7.70
Filling.....do.....	.60
<i>Work at Lock No. 10.</i>	
Excavation.....cubic yard..	.60
Concrete.....do.....	8.00
Filling.....do.....	.60

## CONTRACT FOR CONSTRUCTING WOODEN-HULL TOWBOAT.

Name of contractor: Howard Shipyards Company.

Date of approval: June 28, 1907.

Date of beginning and date of expiration: At the date of notification of approval of contract, and delivery to be made within one hundred days thereafter.

Item.	Contract price.
For one wooden-hull towboat.....	\$14,400

*Muskingum River leases.*

Location.	Lessee.	Dated.	Expires.
<i>Year ending April 30, 1907.</i>			
Dam No. 1, Marietta.....	The Phoenix Mill Co.....	May 1, 1904	May 1, 1924
Dam No. 2, Devols.....	Gates & Payne.....	May 1, 1889	May 1, 1909
Dam No. 3, Lowell.....	Rechsteiner Bros. and J. S. Brown.....	May 1, 1890	May 1, 1910
Do.....	Rechsteiner Bros.....	do.....	Do.....
Do.....	do.....	Nov. 1, 1892	Nov. 1, 1912
Do.....	F. H. Wolfram.....	Dec. 2, 1879	Dec. 15, 1909
Do.....	First National Bank.....	June 1, 1900	Do.....
Do.....	E. W. Webster.....	do.....	June 1, 1906
Dam No. 4, Beverly.....	Robbins Bros.....	May 1, 1889	May 1, 1909
Do.....	Langenberg & Abrams.....	May 1, 1890	May 1, 1910
Do.....	Douglas Groves.....	do.....	Do.....
Do.....	George Walker.....	May 1, 1901	Do.....
Dam No. 6, Stockport.....	J. S. Torbert.....	Oct. 25, 1905	Nov. 1, 1925
Dam No. 7, McConnellsville.....	E. M. Stanbery.....	Sept. —, 1889	—
Do.....	McConnellsville-Malta Electric Co.....	Nov. 1, 1890	Nov. 1, 1920
Dam No. 7, Malta.....	Ohio and Little Kanawha R. R. Co.....	May 1, 1890	May 1, 1925
Dam No. 9, Duncans Falls.....	John Miller.....	Dec. 31, 1836	—
Dam No. 9, Taylorsville.....	Frazier & Son.....	do.....	—
Do.....	Chas. U. Shryock.....	Jan. 12, 1904	May 1, 1924
Do.....	do.....	May 1, 1904	May 1, 1909
Do.....	do.....	Dec. 9, 1905	Nov. 1, 1925
Dam No. 10, Zanesville.....	John T. Drone.....	May 1, 1890	May 1, 1910
Do.....	The Zanesville Rwy., Light and Power Co.....	do.....	Do.....
Do.....	do.....	May 1, 1899	May 1, 1909
Do.....	do.....	Apr. 30, 1903	Apr. 30, 1923
Do.....	Muskingum Coffin Co.....	May 1, 1890	May 1, 1910
Do.....	Zanesville Mantel and Furniture Co.....	do.....	Do.....
Do.....	T. L. Moorehead.....	May 1, 1893	May 1, 1913
Do.....	Muskingum and Ohio River Transportation Co.....	Mar. 23, 1903	Nov. 13, 1907
Symmes Creek.....	Jasper K. McCann.....	May 1, 1906	—
<i>Year ending May 31, 1907.</i>			
Dam No. 10, Zanesville.....	John Blankenbuhler.....	June 1, 1892	June 1, 1909
Do.....	Frederick Abel, est.....	do.....	Do.....

\* Transferred by T. F. Lowe, May 13, 1907.

\* Transferred by the village of Beverly, June 20, 1907.

\* Canceled March 20, 1907.

# 1766 REPORT OF THE CHIEF OF ENGINEERS, U. S. ARMY.

## Leases, water power, land, and rental.

Lessee.	Subject.	Cubic feet of water per minute.	Annual rental.	Rebate.	Rents collected.
The Phoenix Mill Co.....	Water power	12,000	\$300.00	.....	\$300.00
Gates & Payne.....	do	9,000	108.00	.....	108.00
Rechsteiner Bros. and J. S. Brown.....	do	7,280	174.72	.....	174.72
Rechsteiner Bros.....	do	4,446	106.70	.....	106.70
Do.....	Land	.....	10.00	.....	10.00
F. H. Wolfram.....	do	.....	5.00	.....	5.00
First National Bank.....	do	.....	10.00	.....	10.00
E. W. Webster.....	do	.....	5.00	.....	5.00
Robbins Bros. &.....	Water power	1,904	100.00	.....	.....
Langenberg & Abrams.....	do	5,600	114.24	.....	114.24
T. F. Lowe.....	do	6,083	109.80	.....	54.90
Village of Beverly.....	do	5,000	100.00	.....	100.00
J. S. Torbert.....	do	7,315	263.34	.....	263.34
E. M. Stanbery <sup>b</sup> .....	do	(c)	.....	.....	.....
McConnelsville-Malta Electric Co.....	do	8,702	206.84	.....	206.84
Ohio and Little Kanawha R. R. Co.....	Land	.....	2.50	.....	2.50
John Miller <sup>b</sup> .....	Water power	(d)	.....	.....	.....
Frazier & Son <sup>b</sup> .....	do	(d)	.....	.....	.....
Chas. U. Shryock.....	do	6,000	225.00	\$66.87	75.00
Do.....	Land	.....	25.00	.....	25.00
Do.....	do	.....	32.00	.....	32.00
John T. Drone.....	Water power	7,560	453.60	.....	453.60
The Zanesville Rwy., Light and Power Co.....	do	6,029	361.74	.....	361.74
Do.....	do	7,399	443.82	.....	443.82
Do.....	do	50,309	1,760.82	185.86	1,574.96
Muskingum Coffin Co.....	do	4,619	207.86	.....	207.86
Zanesville Mantel and Furniture Co.....	do	4,794	186.96	.....	186.96
T. L. Moorehead.....	Land	.....	25.00	.....	25.00
Muskingum and Ohio River Transportation Co.....	do	.....	25.00	.....	25.00
Jasper K. McCanna.....	do	.....	5.00	.....	.....
John Blankenbuhler.....	Water power	2,700	100.00	.....	100.00
Frederick Abel, est.....	do	5,200	184.50	.....	184.50
Total.....	.....	.....	.....	.....	5,156.68

<sup>a</sup> No collection.

<sup>b</sup> Perpetual free lease of water power.

<sup>c</sup> Enough to propel 10 run of 4-foot 5-inch millstones.

<sup>d</sup> Enough to propel 15 run of 4½-foot millstones.

## COMMERCIAL STATISTICS.

Commerce of Muskingum River during the calendar year ending December 31, 1906.

### Lock No. 1.

Month.	Steam-boats.	Barges.	Miscellaneous.	Rafts.	Total.	Number of lockages.
January.....	39	11	.....	1	51	39
February.....	11	.....	.....	.....	11	11
March.....	72	.....	.....	.....	72	72
April.....	54	8	.....	4	66	66
May.....	69	11	43	.....	123	110
June.....	51	9	58	1	119	96
July.....	43	16	76	25	160	109
August.....	43	11	71	2	127	112
September.....	23	18	48	.....	89	61
October.....	86	17	6	1	110	53
November.....	59	50	61	.....	170	123
December.....	24	21	24	.....	69	52
Total.....	574	172	387	34	1,167	904

*Commerce of Muskingum River, etc.—Continued.*

## LOCK No. 2.

Month.	Steam-boats.	Barges.	Miscellaneous.	Rafts.	Total.	Number of lockages.
January.....	48	5			51	51
February.....	15				15	15
March.....	62				62	62
April.....	48				48	48
May.....	72	8	81		111	109
June.....	70	7	54		131	116
July.....	64	8	76		148	181
August.....	62	4	32		98	98
September.....	58		34		87	87
October.....	67	3	13		83	79
November.....	46		12		58	58
December.....	26	2	5		33	30
Total.....	633	35	257		925	884

## LOCK No. 3.

January.....	50				50	50
February.....	16				16	16
March.....	61				61	61
April.....	47	2			49	49
May.....	69	4	14		87	86
June.....	73	6	21	1	101	87
July.....	69	8	21		98	85
August.....	60	4	27		91	91
September.....	53	2	11		66	66
October.....	69	3	15		77	71
November.....	53	2	7		62	62
December.....	23	1	10		34	33
Total.....	633	32	126	1	792	757

## LOCK No. 4.

January.....	46	2			48	46
February.....	20				20	20
March.....	63				63	63
April.....	45	5			50	50
May.....	65	17	20		102	90
June.....	72	10	13		95	86
July.....	63	8	22		93	81
August.....	56	4	41		101	94
September.....	60	4	14		78	70
October.....	59	3	15		77	71
November.....	58	8	11		77	77
December.....	25	2	5		32	30
Total.....	632	68	141		836	778

## LOCK No. 5.

January.....	7	3			10	10
February.....	4				4	4
March.....	8				8	8
April.....	14		1		15	14
May.....	19	4	7		30	26
June.....	15	5	7		27	23
July.....	11	9	18		38	28
August.....	8	8	24		40	22
September.....	12	6	15		33	24
October.....	9				9	9
November.....	14	5	8		27	27
December.....	8		1		9	9
Total.....	129	40	81		250	204

*Commerce of Muskingum River, etc.—Continued.*

LOCK No. 6.

Month.	Steam-boats.	Barges.	Miscellaneous.	Rafts.	Total.	Number of lock-ages.
January.....	7	1			8	8
February.....	2				2	2
March.....	8				8	8
April.....	15				15	15
May.....	12	6	7		25	17
June.....	15	4	5		24	20
July.....	12	8	12		32	21
August.....	8	4	22		34	18
September.....	12	8	13		33	28
October.....	7	4			11	10
November.....	14	6	5		25	25
December.....	7		1		8	8
Total.....	119	41	65		225	180

LOCK No. 7.

January.....	9				9	9
February.....	2				2	2
March.....	8				8	8
April.....	13				13	13
May.....	12	3	11		26	25
June.....	14	4	5		23	20
July.....	12	8	20		40	32
August.....	8	7	17		32	20
September.....	18	12	15		45	30
October.....	8	4			12	12
November.....	16	5	6		27	27
December.....	8		1		9	9
Total.....	128	48	75		246	207

LOCK No. 8.

January.....	25	4			29	25
February.....	2				2	2
March.....	56				56	56
April.....	60	2			62	62
May.....	65	4	11		80	76
June.....	63	2	10		75	73
July.....	60	4	14		78	75
August.....	58	4	24		86	81
September.....	60	6	10		76	74
October.....	76	7	15		98	84
November.....	71	6	3		80	80
December.....	58	4	1		63	55
Total.....	649	48	88		785	743

LOCK No. 9.

January.....	25	4			29	25
February.....	2				2	2
March.....	56				56	56
April.....	57				57	57
May.....	70	4	11		85	78
June.....	69	2	1		72	69
July.....	75	7	7		89	80
August.....	90	10	6		106	106
September.....	81	53			134	131
October.....	38	45			83	83
November.....	81	46	4		131	131
December.....	58	15	1		74	67
Total.....	697	186	30		913	885

*Commerce of Muskingum River, etc.—Continued.*

## LOCK No. 10.

Month.	Steam-boats.	Barges.	Miscellaneous.	Rafts.	Total.	Number of lock-ages.
January ..	25	5			30	29
February ..	2				2	2
March ..	52				52	52
April ..	57				57	57
May ..	67	4	14		85	79
June ..	68	2	3		68	68
July ..	58	4	7		69	66
August ..	81		2		83	82
September ..	66	4			70	66
October ..	75				75	74
November ..	60	7	5		72	72
December ..	50	16	2		68	68
Total ..	656	42	33		731	713

## SUMMARY.

Lock No.	Steam-boats.	Barges.	Miscellaneous.	Rafts.	Total.	Number of lock-ages.
1 ..	574	172	387	34	1,167	904
2 ..	633	35	257		925	884
3 ..	633	32	126	1	792	757
4 ..	632	68	141		836	778
5 ..	129	40	81		250	204
6 ..	119	41	65		225	180
7 ..	128	43	75		246	207
8 ..	649	43	88		780	743
9 ..	697	186	30		913	885
10 ..	656	42	33		731	713
Total ..	4,860	697	1,283	35	6,865	6,265

*Statement of commerce passing the locks on the Muskingum River, Ohio, during the calendar year ending December 31, 1906.*

Articles.	Lock No.—									
	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.
	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.
Beer ..	12	127	112	51	3	2		2	3	8
Brick ..	68	109	93	58				98	96	129
Cattle ..	776	893	677	665	480	425	826	314	355	403
Coal ..	1,625	857	568	758	475	450	460	424	500	746
Cement ..		15	8	8				43	51	70
Corn ..	384	359	310	346	66	90	124	339	445	652
Eggs ..	1,074	936	810	792	621	534	384	349	366	422
Flour ..	413	594	599	562	206	223	223	340	427	479
Hay ..	941	1,323	1,190	1,185	750	600	480	837	963	1,122
Horses ..	320	248	286	282	266	274	220	230	218	298
Hogs ..	183	253	210	190	143	118	115	61	59	71
Iron, manufactured	1,016	1,032	985	934	832	763	779	420	441	457
Lime ..		1		6				9	34	6
Lumber ..	1,458	604	538	401	356	298	248	883	610	571
Merchandise, miscellaneous ..	16,690	18,186	13,334	12,487	8,197	5,965	6,738	13,414	15,973	14,358
Oil ..	243	313	198	192	128	142	131	176	210	309
Poultry ..	198	152	122	110	72	88	69	33	22	19
Produce ..		52	10	13					2	
Salt ..	397	366	298	275	215	223	137	214	346	347
Sand ..	1,450									
Stoneware ..	220	221	220	221	221	154	224	199	201	201
Straw ..	260	412	353	349	146	202	98	525	741	624
Sugar ..		21	2	4				63	48	49
Wheat ..	706	777	595	722	603	630	481	262	369	565
Wool ..						30		5		
Total ..	28,433	27,961	21,513	20,611	18,780	11,201	11,237	18,740	22,539	21,910
Passengers ..	28,849	24,331	19,111	12,129	3,309	2,782	4,428	12,326	21,683	36,014

# 1770 REPORT OF THE CHIEF OF ENGINEERS, U. S. ARMY.

*List of steamboats (stern-wheel) plying on the Muskingum River between Zanesville and Marietta, Ohio.*

Name of steamer.	Length.	Breadth.	Depth.	Draft.	Tonnage.
	<i>Feet.</i>	<i>Feet.</i>	<i>Feet.</i>	<i>Inches.</i>	
Lorena .....	141	32	5	24	287
Sonoma .....	125	20	3½	23	116
Valley Gem .....	125	26½	4	24	156
Vega .....	104	17½	4	26	90
Excelsa .....	110	18	3	24	100
Jewels .....	120	23	3	18	100
Pioneer City <sup>a</sup> .....	100	35	4	24	100
Rival .....	150	28	4½	36	175
Ruth .....	140	26	3	24	175
Valley Belle <sup>a</sup> .....	130	22	3½	24	125
T. M. Patea <sup>a</sup> .....	140	28	4	30	140
Darling <sup>a</sup> .....	120	24	4	36	125
Bernadina King <sup>a</sup> .....	100	18	2½	30	100
Reaper <sup>a</sup> .....	160	28	4	36	150
Robt. Taylor <sup>a</sup> .....	140	26	4	36	140
Carrie V. <sup>a</sup> .....	125	20	3	24	90
Conquest <sup>a</sup> .....	130	23	3½	24	100
French <sup>a</sup> .....	104	19½	4½	26	76
Clerimond <sup>a</sup> .....	120	22	4	28	100

<sup>a</sup> Only occasional trips.

*List of gasoline boats plying on the Muskingum River between Marietta and Dresden, Ohio.*

Name of steamer.	Length.	Breadth.	Depth.	Draft.	Tonnage.
	<i>Feet.</i>	<i>Feet.</i>	<i>Feet.</i>	<i>Inches.</i>	
Outing .....	47	9	4	30	6
Kill Kare .....	35	6	3	30	3
Gadabout .....	21	4½	2½	22	2
Muskingum .....	18	4	2	12	1
England .....	16	4	2	12	1
Janette .....	16	4	2	12	1
Beatty .....	20	5½	2½	20	2
Alice .....	18	5	2½	20	2
Bay Lee .....	18	4½	2	18	2
Uarda .....	49	16	2½	18	12
Malew .....	40	8	4½	36	9
Anna Louise .....	20	4	2	12	1
Kid .....	76	16	2½	20	15

*List of gasoline towboats and pleasure boats plying on the Muskingum River between Marietta and Beverly, Ohio.*

Name of boat.	Character.	Length.	Beam.	Draft.
		<i>Feet.</i>	<i>Feet.</i>	<i>Inches.</i>
Eleanor .....	Towboat .....	90	14	24
Annie M. Shaw .....	do .....	60	12	20
Shifter .....	do .....	40	13	24
Hustler .....	do .....	35	14	24
Helen W. .....	do .....	40	12	24
Calhoun .....	do .....	65	12	24
Creston .....	do .....	40	12	24
Carbon Black .....	do .....	60	12	24
Marietta .....	Pleasure boat .....	40	12	36
Truscott .....	do .....	16	4	24
Laken .....	do .....	18	4	24
Earl .....	do .....	14	4	30
Bessie .....	do .....	12	3	24
Ada .....	do .....	24	6	36
Nixon .....	do .....	35	8	36
Freda .....	do .....	18	6	30
Racine .....	do .....	20	5	24
Lillian .....	do .....	14	3	18
Booth .....	do .....	26	5	30
Titley .....	do .....	14	5	24
Arthur D. .....	do .....	16	4	24
Missen .....	do .....	18	5	30



*List of gasoline towboats and pleasure boats, etc.—Continued.*

Name of boat.	Character.	Length.	Beam.	Draft.
		<i>Feet.</i>	<i>Feet.</i>	<i>Inches.</i>
Belle B. ....	Pleasure boat .....	18	5	18
Ethel .....	do .....	40	8	24
Lavina .....	do .....	40	8	24
Mydell .....	do .....	18	5	24
Idler .....	do .....	14	5	20
Avalon .....	do .....	18	6	26
Grace .....	do .....	16	5	24
May .....	do .....	18	5	24
Jim Gay .....	do .....	14	5	24
Atlas .....	do .....	18	6	26

## H H 3.

## IMPROVEMENT OF BIG SANDY RIVER, WEST VIRGINIA AND KENTUCKY, AND TUG AND LEVISA FORKS OF SAME.

The natural condition of this river and its forks, and projects for their improvement, are given in the current summary.

## OPERATIONS DURING THE FISCAL YEAR.

*Lock No. 1, Big Sandy River.*—The work of constructing, in concrete, the regulating works below the lock and the paving behind lock wall, under contract with the Baker Contract Company, dated July 17, 1906, and now in the hands of a receiver, The Colonial Trust Company, of Pittsburg, Pa., was commenced in 1906. The paving behind the lock wall has been completed. The placing of concrete in the guide and retaining walls in prolongation of the land wall of the lock was commenced on November 16, 1906. On that date one block of one section was placed; since that date, owing to continued high water, no work for which payment is to be made under the contract has been done.

The following is a statement of work done during the year:

Classification.	Designation.	Quantities.	Rate.	Amount.
Excavation .....	Cubic yards .....	745	\$0. 80	\$596. 00
Concrete .....	do .....	71	8. 50	603. 50
Steel .....	Pounds .....	214	.05	10. 70
Skilled labor .....	Hours .....	11	.25	2. 75
Unskilled labor .....	do .....	19	.15	2. 85
Total .....				1, 215. 80

Plans for the steel service bridge for weir of the dam which was provided for in the river and harbor act of March 2, 1907, at an estimated cost of \$7,000 have been completed with a view to an early advertisement inviting proposals for its construction.

*Lock No. 3, Big Sandy River.*—Plans for raising the crest of the dam authorized in the river and harbor act of June 13, 1902, are in course of preparation.

*Lock No. 1, Tug Fork.*—The work of constructing the lock, in concrete, under contract with the Hollerbach and May Contract Com-

pany, of Evansville, Ind., was in progress at the beginning of the year and was completed and final payment made February 19, 1907.

The following is a statement of work done during the year:

Classification.	Unit.	Quantities.	Rate.	Amount.
Piling.....	Linear feet.....		\$0.40	
Cofferdam timber.....	Feet B. M.....	948.5	60.00	\$56.91
Riprap.....	Cubic yards.....		1.50	
Earth excavation.....	do.....		.50	
Loose rock excavation.....	do.....		.50	
Solid rock excavation.....	do.....		.50	
Embankment.....	do.....		.20	
Concrete.....	do.....		4.00	
Pivot stones.....	Pieces.....		50.00	
Timber in permanent work.....	Feet B. M.....	9,471	60.00	568.26
Iron and steel.....	Pounds.....	193,678	.04	7,747.12
Vitrified pipe culvert.....	Linear feet.....		5.50	
Concrete culvert.....	do.....		5.50	
Skilled labor.....	Hours.....	184	.25	46.00
Unskilled labor.....	do.....	406	.15	60.90
Total.....				8,479.19

The culvert at the lower end of lock was protected from washout by a wooden flume leading from the mouth of the culvert out into the river. Concrete floor was placed in cellar of dwelling, and cellar and grounds drained.

A survey of the site of the proposed dam has been made, and discharge observations taken.

*Lock No. 1, Levisa Fork.*—The work of constructing this lock, in concrete, under contract with the Baker Contract Company, dated March 9, 1905, and now in the hands of a receiver, The Colonial Trust Company, of Pittsburg, Pa., was in progress at the beginning of the year, and at the close of the year the work was practically completed. The only work remaining to be done is the placing of some gate timber, installing gate valves, and removing plant.

The following is a statement of work done during the year:

Classification.	Unit.	Quantities.	Rate.	Amount.
Piling.....	Linear feet.....		\$0.50	
Cofferdam timber.....	Feet B. M.....		50.00	
Riprap.....	Cubic yards.....	1.5	2.00	\$3.00
Rock excavation.....	do.....	200	2.00	400.00
Earth excavation.....	do.....	655	.30	196.50
Embankment.....	do.....	754	.50	377.00
Concrete.....	do.....	1,597	4.25	6,787.25
Pivot stones.....	Pieces.....		40.00	
Timber in permanent work.....	Feet B. M.....	2,098	80.00	167.84
Iron and steel.....	Pounds.....	20,042	.06	1,502.52
Skilled labor.....	Hours.....	51	.25	12.75
Unskilled labor.....	do.....	66	.15	9.90
Total.....				9,456.10

The cement used in the construction of this lock was purchased by the United States from the Alma Cement Company, of Wellston, Ohio, under contract dated June 5, 1905, at a rate of \$1.85 per barrel, f. o. b. cars Saltpeter, W. Va., with a rebate of 10 cents per bag for each empty bag returned to the point of delivery; 1,198½ barrels were delivered during the year.

A survey of the site of the proposed dam has been made and discharge observations taken.

## MAINTENANCE.

*Tug Fork.*—A snagging party, consisting of an overseer and 10 men, left Louisa in a push boat on July 16, proceeded as far as Warfield, Ky., and returned to Louisa on September 11, 1906, removing all dangerous snags, rocks, and trees by use of dynamite.

The following is a statement of obstructions removed:

	Quantity.	Number.
Trees.....cubic feet.....	2,945	88
Snags.....do.....	40,415	1,128
Rock.....do.....	10,960	
Dynamite expended.....pounds.....	617	

*Levisa Fork.*—There were no snagging operations.

Commercial statistics are reported under the head of "Operating and care," etc.

*Money statement.*

July 1, 1906, balance unexpended.....	\$153,370.99
Received from other sources.....	.75
Amount appropriated by river and harbor act approved March 2, 1907.....	107,000.00
	<hr/> 260,371.74
June 30, 1907, amount expended during fiscal year:	
For works of improvement.....	\$49,150.39
For maintenance of improvement.....	3,470.22
	<hr/> 52,620.61
July 1, 1907, balance unexpended.....	207,751.13
July 1, 1907, outstanding liabilities.....	218.47
	<hr/> 207,532.66
July 1, 1907, balance available.....	<hr/> 207,532.66
July 1, 1907, amount covered by uncompleted contracts.....	55,692.93
Amount (estimated) required for completion of existing project..	3,840,000.00
	<hr/> <hr/>
Amount that can be profitably expended in fiscal year ending June 30, 1909, in addition to the balance unexpended July 1, 1907:	
For works of improvement.....	\$135,000.00
For maintenance of improvement.....	20,000.00
	<hr/> 155,000.00
Submitted in compliance with requirements of sundry civil act of June 4, 1897, and of section 7 of the river and harbor act of 1899.	

## APPROPRIATIONS.

July 18, 1878.....	\$12,000.00	June 6, 1900 (allotted)...	\$2,000.00
March 3, 1879.....	12,000.00	March 3, 1901.....	140,000.00
June 14, 1880.....	55,000.00	June 13, 1902.....	178,000.00
March 3, 1881.....	50,000.00	March 3, 1903.....	50,000.00
August 2, 1882.....	25,000.00	March 3, 1905 (river and harbor).....	43,000.00
July 5, 1884.....	50,000.00	March 3, 1905.....	85,000.00
August 5, 1886.....	30,000.00	June 30, 1906.....	40,000.00
August 11, 1888.....	31,500.00	March 2, 1907.....	107,000.00
September 19, 1890.....	36,000.00	Received from other sources.....	1,705.63
July 13, 1892.....	55,000.00		
August 18, 1894.....	45,000.00		
June 3, 1896.....	33,000.00		
March 3, 1899.....	52,500.00		
June 6, 1900.....	280,000.00	Total.....	1,413,705.63

# 1774 REPORT OF THE CHIEF OF ENGINEERS, U. S. ARMY.

## CONTRACTS IN FORCE.

### CONTRACT FOR BUILDING LOCK NO. 1, TUG FORK OF BIG SANDY RIVER, WEST VIRGINIA AND KENTUCKY.

Name of contractor: The Hollerbach & May Contract Company.

Date of approval: April 10, 1905.

Date of beginning: Delivery of material must begin within thirty days after receipt of notice of approval of contract.

Date of expiration: January 1, 1907.

Item.	Contract price (unit rate).
Piling ..... per linear foot..	\$0.40
Cofferdam timber ..... per M feet B. M.	60.00
Riprap ..... per cubic yard..	1.50
Earth excavation ..... do ..	.50
Loose-rock excavation ..... do ..	.50
Solid-rock excavation ..... do ..	.50
Embankment ..... do ..	.20
Concrete ..... do ..	4.00
Pivot stones ..... per piece ..	50.00
Timber in permanent work ..... per M feet B. M.	60.00
Iron and steel ..... per pound ..	.04
Vitrified-pipe culvert ..... per linear foot..	5.50
Concrete culvert ..... do ..	5.50

Completed.

### CONTRACT FOR BUILDING LOCK NO. 1, LEVISA FORK OF BIG SANDY RIVER, WEST VIRGINIA AND KENTUCKY.

Name of contractor: Baker Contract Company.

Date of approval: March 23, 1905.

Date of beginning: Delivery of material must begin within thirty days after receipt of notice of approval of contract.

Date of expiration: January 1, 1907.

Item.	Contract price (unit rate).
Piling ..... per linear foot..	\$0.50
Cofferdam timber ..... per M feet B. M.	50.00
Riprap ..... per cubic yard..	2.00
Rock excavation ..... do ..	2.00
Earth excavation ..... do ..	.80
Embankment ..... do ..	.50
Fuddling ..... do ..	2.00
Concrete ..... do ..	4.25
Pivot stones ..... per piece ..	40.00
Timber in permanent work ..... per M feet B. M.	50.00
Iron and steel ..... per pound ..	.06

Completed.

### CONTRACT FOR FURNISHING AND DELIVERING AMERICAN PORTLAND CEMENT FOR USE IN THE CONSTRUCTION OF LOCK NO. 1, TUG FORK, AND LOCK NO. 1, LEVISA FORK, OF BIG SANDY RIVER, WEST VIRGINIA AND KENTUCKY.

Name of contractor: Alma Cement Company.

Date of approval: June 21, 1905.

Date of beginning and date of expiration: Cement will be delivered as required in lots of from 1 to 8 carloads each. If the work of construction proceeds as expected, the entire amount of cement will be needed during the working season of 1905; but it is possible that the contract may not be completed until the season of 1906.

Item.	Contract price, per barrel, in bags.
Alma Portland cement:	
9,700 barrels, in cloth bags, delivered f. o. b. Saltpetre, W. Va., for Lock No. 1, Tug Fork.....	\$1.85
7,100 barrels, in cloth bags, delivered f. o. b. Chapman station, Ky., for Lock No. 1, Levisa Fork.....	1.87

\* Rebate of 10 cents allowed for each empty bag returned to point of delivery.

Completed.

CONTRACT FOR CONSTRUCTING GUIDE AND RETAINING WALLS AND PAVING AT LOCK NO. 1, BIG SANDY RIVER, WEST VIRGINIA AND KENTUCKY.

Name of contractor: Baker Contract Company.

Date of approval: August 15, 1906.

Date of beginning: Delivery of material must begin within thirty days after receipt of notice of approval of contract.

Date of expiration: December 31, 1906.

Items.	Contract price (unit rate).
<i>Plan No. 1.</i>	
Excavation.....cubic yard..	\$0.80
Embankment.....do.....	.55
Concrete.....do.....	8.50
Ballast.....do.....	2.50
Riprap.....do.....	3.00
Steel.....pound..	.06
<i>Paving.<sup>a</sup></i>	
Paving.....cubic yard..	8.50
Ballast.....do.....	2.50

\* Completed.

## H H 4.

OPERATING AND CARE OF LOCKS AND DAMS ON THE BIG SANDY RIVER, WEST VIRGINIA AND KENTUCKY.

Under an allotment from the indefinite appropriation for operating and care of canals and other works of navigation there has been expended during the year \$20,494.78.

OPERATIONS DURING THE FISCAL YEAR.

*Lock No. 1, Catlettsburg, Ky.*—Minor repairs, carpentry, plumbing, etc., were made to the lock dwellings and new door and window screens installed. The cistern of the lock master's house was cleaned and repaired and a new pump placed. Gas pipes were laid and two street lights installed on the grounds. A new workshop and tool house combined, was constructed. The old workshop was moved back from the street, repaired and painted, and a new concrete forge built therein. Concrete sidewalks were built around the workshops and a concrete fence constructed between the Government lot and adjacent property. Concrete steps with iron hand rail were constructed connecting the levels of the house lot and lock walls. The

river slope of the grounds was sodded. Minor repairs were made to hull and to the derrick and machinery of the maneuvering boat. Repaired broken anchorage of the upper land gate and repaired the automatic valves in the river wall of lock. Under contract with Lawrence D. Weaning, of Cleveland, Ohio, dated October 20, 1906, ten new butterfly steel valves with their operating machinery were furnished and delivered at the lock. These valves are to be installed in the upper lock gate.

One serious accident occurred during the year. The old apparatus for tripping the wickets of the Chanoine weir had never been satisfactory, and a new apparatus was designed and ordered. There was a great delay in the delivery of the apparatus on account of the difficulty of getting cast-steel gears. In the meantime a temporary tripping apparatus was installed. On November 19-20, 1906, there was a sharp rise of the river, accompanied by a run of loose logs in great numbers. An attempt was made to lower the weir, but after several wickets had been tripped the temporary tripping apparatus failed. As a consequence all the wickets that remained standing were knocked down by the logs. Many of the wickets were badly twisted and bent. One was lost entirely and all sustained injuries. Damage was also done to the trestles of the pass by the logs which were running in great numbers when the pass was lowered. After this flood the lost wicket was recovered and the bent and twisted wickets were straightened. The new tripping apparatus was also installed.

The construction of cribwork for the protection of abutment below the dam is in progress at the close of the year. A contract for the timber was made with Mr. J. W. Harris, of Catlettsburg, Ky., under date of May 29, 1907, and a contract for the stone was made with McKay & Runyon, of Catlettsburg, Ky., under date of May 11, 1907. The work will be done by hired labor.

During the flood of November, 1906, a large number of dam needles were lost. Most of these were recovered.

The principal maneuvers of the dam during the year were as follows:

Dam up at beginning of year; entirely lowered August 14-18; pass raised in latter part of August and weir raised on September 14; entire dam lowered November 19, 1906.

*Lock No. 2, Kavanaugh, Ky.*—The interior of the blacksmith shop was ceiled, a stairway built to attic, and windows placed in the gables. Minor repairs have been made to the outbuildings. Tile drainage pipes were laid at the upper end of the lot. A concrete walk was built from the lockmaster's house to the blacksmith shop. Repairs and extensions were made to the road through the grounds. Grading and sodding of the bank behind the land wall and filling low places on the lot was continued throughout the year when conditions permitted. Minor repairs were made to the derrick and machinery of the maneuvering boat. Two iron check posts were set in the lock walls, and flashboards placed on the lock gates. Repaired damaged valve screens. One cylindrical valve in the land wall was broken. The mouth of its culvert was temporarily closed with a wooden screen, and a new valve has been ordered. Repaired automatic valves in river wall of lock.

The weir of the dam is similar to that of Dam No. 1, and, as at the latter place, the old tripping apparatus has not been satisfactory. A temporary tripping apparatus was in use during the rise and log run of November 19-20, 1906. It operated satisfactorily on this occasion, and the weir was entirely lowered. The logs, however, coming in great quantities, jammed in the weir, and this produced so swift a current through the lock (where the gates had just been opened to prevent the accumulation of deposit) that the river leaf of the upper gate was torn from its fastenings and slammed violently shut. The leaf rode up on the miter sill and was badly twisted and bent. It was not torn loose, however, and after the flood it was taken off the sill and straightened. The new cast-steel tripping apparatus was subsequently installed on the weir. A few pass needles were lost during this flood, and 20 new needles have been constructed to replace lost needles at Dams Nos. 1 and 2 and to provide extra ones in case of loss.

The principal maneuvers of the dam during the year were as follows:

Dam up at beginning of year; latter part of July escaped three bays and lowered four wickets to allow repairs to valves; August 15-18, lowered remainder of dam; entire dam raised August 23-28; part of pass lowered and wickets of weir placed on the swing September 1-10; pass raised and wickets righted September 10-20; entire dam lowered November 19, 1906.

*Lock No. 3, Louisa, Ky.*—The lock dwellings, outbuildings, blacksmith shop, and sheds on the West Virginia side were painted. Minor repairs have been made to all the buildings. Extensive repairs were made to the hull of the old maneuvering boat and new tubes were placed in the boiler of the hoisting engine. Repairs were made to one of the flatboats. All the cisterns were siphoned out and cleaned. The patterns for iron castings for all the locks and dams were sorted, listed, and arranged. Work was commenced on a concrete landing for skiffs below the lock, but stopped by high water. Tools and machinery to be used in installing valves in the lock gate at Lock No. 1 were made at this lock. A track for hauling needles and materials up the bank was constructed on the West Virginia side, and a car to run on the track. The construction of the new machine shop has been commenced, the foundation and cistern being completed, also the foundation for the engine bed. All the material for this shop, except sand, is on the ground, including a 6-horsepower gas engine, which will furnish the power to operate the shop. The construction of the new maneuvering boat has not been commenced on account of the difficulty of obtaining oak lumber for the hull. Some of the ironwork has been made, and some material, including a 6½ by 10 inch double-cylinder, double-drum hoisting engine and boiler has been delivered. The oak lumber for the hull has been ordered and will be delivered shortly.

This dam has not been in operation since December, 1905, when several of the pass trestles were so severely injured that the dam could not be raised. It was decided to replace the old trestles with 6 new wide-span trestles. Contract to furnish the new ironwork, including trestles and escape bars, was entered into with the Cincinnati Forging and Smithing Company, of Cincinnati, Ohio. The

ironwork was delivered in August, 1906, at a cost of \$2,782.25. The material was riveted together by the lock force. The work in the river was greatly delayed by high water, but late in the season a portion of the foundation of the pass was coffered off and the work of altering the foundation to receive the new trestles was commenced with hired labor and a hired barge and steam drill. The work was about half done when it was very suddenly stopped by a rise of the river on November 19-20, 1906. The cofferdam, which was a very light structure in a very exposed position, was washed out and the greater part of it lost.

*Maintenance.*—Under the allotment for this purpose all obstructions were removed from the channel of the main river from the head of slack water above Louisa, Ky. (Lock No. 3), to a point 18 miles below Louisa, Ky. (between Locks Nos. 1 and 2). This work was done by a party consisting of an overseer and eleven men, traveling in a push boat. Following is a statement of the work accomplished:

	Quantity.	Number.
Trees.....cubic feet..	2,415	30
Snags.....do....	21,804	650
Rock.....do....	13,720	.....
Barge.....	.....	1
Dynamite expended.....pounds..	717	.....

*Summary of expenditures for operating and care of locks and dams on Big Sandy River, West Virginia and Kentucky, for the fiscal year ending June 30, 1907.*

Services.....	\$11,079.06
Supplies.....	61.32
Materials.....	7,845.19
Miscellaneous expenses.....	1,509.21
<b>Total.....</b>	<b>20,494.78</b>

ALLOTMENTS.

July 23, 1897.....	\$2,840.00	October 31, 1904.....	\$1,650.00
July 23, 1898.....	3,250.95	July 31, 1905.....	12,780.27
July 19, 1899.....	3,524.28	March 14, 1906.....	4,950.00
July 18, 1900.....	3,177.09	July 28, 1906.....	16,015.19
July 10, 1901.....	3,658.12	March 1, 1907.....	13,700.00
July 17, 1902.....	5,075.88	Received from other sources.....	3.65
July 18, 1903.....	2,677.98		
July 11, 1904.....	2,950.48	<b>Total.....</b>	<b>76,253.89</b>



## CONTRACTS IN FORCE.

**EMERGENCY CONTRACT FOR METAL WORK FOR REPAIRS TO DAM NO. 3, BIG SANDY RIVER, WEST VIRGINIA AND KENTUCKY.**

Name of contractor: The Cincinnati Forging and Smithing Company.

Date of approval: (Emergency contract.)

Date of beginning and date of expiration: To be completed on or before July 15, 1906.

Items.	Contract price per 100 pounds.
Iron and steel .....	\$5.99
Cast iron .....	4.72
Chain .....	4.74

Completed.

**EMERGENCY CONTRACT FOR METAL WORK FOR REPAIRS TO LOCK AND DAM NO. 1.**

Name of contractor: Lawrence D. Weaning.

Date of approval: (Emergency contract.)

Date of beginning and date of expiration: To be completed on or before April 15, 1907.

Items.	Contract price (unit rate).
Ten steel valves, complete .....	\$0.06
Ten steel valve boxes, complete .....	.06
Twenty cold-rolled steel or cast journal bearings .....	.22½

Completed.

**EMERGENCY CONTRACT FOR FURNISHING AND DELIVERING STONE AT THE SITE OF LOCK NO. 1.**

Name of contractor: McKay &amp; Runyon.

Date of contract: (Emergency contract.)

Date of beginning and date of expiration: To be completed on or before August 15, 1907.

Item.	Contract price per ton.
Slope for constructing cribwork, etc., at Lock No. 1, Big Sandy River, Catlettsburg, Ky. ..	\$1.70

**EMERGENCY CONTRACT FOR FURNISHING AND DELIVERING TIMBER AT THE SITE OF LOCK NO. 1.**

Name of contractor: J. W. Harris.

Date of contract: (Emergency contract.)

Date of beginning and date of expiration: To be completed on or before July 1, 1907.

Item.	Contract price per M. feet B. M.
Timber for constructing crib work, etc., at Lock No. 1, Big Sandy River, Catlettsburg, Ky.	\$22.00

## COMMERCIAL STATISTICS.

*Big Sandy River, West Virginia and Kentucky, including Tug and Levisa forks for calendar year ending December 31, 1906, and prior years.*

Articles.	1901.	1902.	1903.	1904.	1905.	1906.
	<i>Tons.</i>	<i>Tons.</i>	<i>Tons.</i>	<i>Tons.</i>	<i>Tons.</i>	<i>Tons.</i>
Timber .....	260,000	250,000	134,085	98,459	123,456	168,830
Hides .....	34	15	22	297	15	14
Leather .....	1	1	8	1		
Lumber .....	13,000	98	379	862	225	144
Produce .....	9,000	6,000	52	30	9	169
Live stock .....	235	725	494	139	44	102
Spokes .....	10	55	1,763	1,108	148	
Staves .....	3,480	1,720	1,604			4
Tan bark .....	550	35				
Ties .....	44,000	44,067	128,280	38,852	18,781	22,438
Grain .....	154	196	1,674	867	33	811
Wool .....	2	2	2	1	1	
Miscellaneous .....	19,000	47,614	26,017	16,718	5,868	12,915
Passengers .....	396	412	1,096	243	98	449
Total .....	349,862	350,935	290,401	152,077	148,623	206,901

*List of vessels, rafts, etc., passing locks and dams on Big Sandy River, for the calendar year ending December 31, 1906.*

Craft.	Lock and Dam No. 1.		
	Up.	Down.	Total.
Steamboats .....	429	430	859
Barges and flats .....	4	14	18
Rafts .....		2,568	2,568
Ties .....		169,500	169,500

Craft.	Lock and Dam No. 2.		
	Up.	Down.	Total.
Steamboats .....	230	222	452
Barges and flats .....	26	20	46
Rafts .....		2,252	2,252
Ties .....		230,717	230,717

Craft.	Lock and Dam No. 3.		
	Up.	Down.	Total.
Steamboats .....	188	198	386
Barges and flats .....	26	26	52
Rafts .....		1,701	1,701
Ties .....		198,705	198,705

*Lockages on Big Sandy River during the calendar year ending December 31, 1906.*

	Lock No. 1.		Lock No. 2.		Lock No. 3.	
	Up.	Down.	Up.	Down.	Up.	Down.
May .....		9	1	4		
June .....	19	115	27	44		
July .....	8	64	28	100		
August .....	12	56	4	6		
September .....	4	44	15	39		
October .....	3	29	7	21		
November .....	2	13	2	11		
Total .....	48	330	84	225		

No lockages during remainder of year.

No lockages were made at Lock No. 3, the dam being out of repair.

*List of boats plying Big Sandy River, West Virginia and Kentucky, and Tug and Levisa forks of same.*

Name of boat.	Character.	Length.	Breadth.	Depth.	Tonnage.
		<i>Feet.</i>	<i>Feet.</i>	<i>Feet.</i>	
Sea Lion.....	Stern-wheel.....	123.00	22.00	3.50	127.00
Cando.....	do.....	117.50	20.00	3.00	74.00
Thealka.....	Side-wheel.....	116.00	19.20	3.20	46.00
Donca.....	Stern-wheel.....	109.50	18.40	3.00	56.00
Guyandotte.....	Side-wheel.....	104.00	16.00	2.80	48.83
Sam A. Conner.....	Stern-wheel.....	98.50	16.00	1.50	68.00
Emma Marie.....	do.....	93.00	15.00	2.50	73.00
Sea Gull.....	Side-wheel.....	90.00	12.00	2.60	30.24
Natches.....	do.....	82.00	8.75	1.42	12.97
Dan Patch.....	do.....	81.00	12.00	1.91	16.00
Mildred Runyon.....	Stern-wheel.....	68.00	12.00	1.83	13.00
Ollie S.....	do.....	56.00	12.00	2.00	13.00
Annie M. Shaw.....	do.....	55.90	11.00	1.10	12.00
Gordon Nigh.....	do.....	55.00	8.83	2.50	.....
Andree Maxine.....	do.....	52.70	12.00	1.67	11.00
Little Bill.....	do.....	51.00	8.00	1.33	10.00
Marie.....	do.....	47.00	8.00	1.17	8.00
Polly.....	do.....				
Catherine Davis.....	do.....				
Cricket.....	do.....				

## H H 5.

## IMPROVEMENT OF KENTUCKY RIVER, KENTUCKY.

The natural condition of this work and projects for its improvement are described and reference for more extended information given in the current summary.

## OPERATIONS DURING THE FISCAL YEAR.

*Lock and Dam No. 11.*—The work of constructing this lock and dam, under contract with H. E. Talbott & Co., of Dayton, Ohio, dated September 28, 1903, and supplemental contracts dated September 26, 1905, and March 31, 1906, was in progress at the beginning of the fiscal year, and completed December 26, 1906.

The work done during the year was as follows:

*Work done under original contract, dated September 28, 1903.*

Classification.	Quantities.	Price.	Amount.
Cofferdam timber.....feet B. M.	133,050	\$39.00	\$5,188.95
Timber in permanent construction.....do.	9,826	50.00	491.30
Piling.....linear feet	7,150	.45	3,217.50
Cofferdam filling.....cubic yards	11,778	.40	4,711.20
Embankment.....do.	1,108	.45	498.60
Earth excavation.....do.	8	2.50	7.50
Rock excavation.....do.	231	.50	115.50
Deposit.....do.	4,642.53	4.55	21,122.76
Concrete.....do.			
Armored concrete in approach wall.....do.			
Riprap.....do.	1,150	1.70	1,955.00
Rough paving.....do.	53	1.70	90.10
Stone masonry.....do.			
Iron and steel.....pounds	166,087	.07	10,852.59
Driftbolts.....do.	8,732	.05	436.60
Fence.....linear feet			
Tile drains.....do.			
Skilled labor.....hours	272	.25	68.00
Unskilled labor.....do.	342	.15	51.30
Total.....			48,806.90

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*Work done under supplemental contract dated September 26, 1905.*

Classification.	Quantities.	Price.	Amount.
Armored concrete paving.....cubic yards..	1,799	\$7.25	\$13,042.75

*Work done under supplemental contract dated March 31, 1906.*

Classification.	Quantities.	Price.	Amount.
Timber in permanent construction.....feet B. M..	3,437	\$50.00	\$171.85
Rock excavation.....cubic yards..	1,380.66	2.50	3,451.65
Concrete.....do.	240	4.65	1,116.00
Iron and steel.....pounds..	63,439	0.095	6,026.71
Total .....			10,766.21

The cement for this work was purchased by the United States under contract dated July 28, 1905, with the Virginia Portland Cement Company, of New York, N. Y.; 5,127 barrels were delivered during the year in canvas bags, at \$1.97 per barrel, subject to a rebate of 10 cents per bag for each empty bag returned to the point of delivery.

*Lock and Dam No. 12.*—A survey of the site selected and test borings to determine the location and character of the bed rock were made, the necessary land purchased and staked off, specifications and plans drawn, and under date of June 10, 1907, a contract was entered into with William Preston Eckley, of Winchester, Ky., for the construction of the buildings, etc., and under date of June 22, 1907, a contract was made with the Ohio River Contract Company, of Evansville, Ind., for the construction of the lock and dam in concrete. At the close of the year nothing had been done under these contracts except preliminary work.

*Lock and Dam No. 13.*—A survey of the site selected, which is located about 3 miles below Willow Shoals station, and test borings to determine the character of the bed rock underlying the river have been made; the title to the necessary land has not yet been acquired.

*Lock and Dam No. 14.*—A survey of the selected site, which is located near Heidelberg, Ky., and test borings to determine the character of the rock underlying the river bed have been made; title to the necessary land has not yet been acquired.

The commercial statistics are given in the report for operating and care of locks and dams on the Kentucky River, Kentucky.

## *Money statement.*

July 1, 1906, balance unexpended.....	\$180,228.93
Amount appropriated by river and harbor act approved March 2, 1907.....	100,000.00
Amount appropriated by sundry civil act approved March 4, 1907.....	75,000.00
Amount received from other sources.....	42.30

**364,271.23**

June 30, 1907, amount expended during fiscal year, for works of improvement .....	\$104,387.87
July 1, 1907, balance unexpended.....	259,883.36
July 1, 1907, outstanding liabilities.....	619.00
July 1, 1907, balance available.....	259,264.36
July 1, 1907, amount covered by uncompleted contracts.....	389,112.75
Amount (estimated) required for completion of existing project.....	1,710,000.00
<hr/>	
{ Amount that can be profitably expended in fiscal year ending June 30, 1909, for works of improvement, in addition to the balance unexpended July 1, 1907.....	519,000.00
{ Submitted in compliance with requirements of sundry civil act of June 4, 1897.	

## APPROPRIATIONS.

March 3, 1879.....	\$100,000.00	July 1, 1898.....	\$350,000.00
June 14, 1880.....	100,000.00	June 6, 1900.....	75,000.00
March 3, 1881.....	125,000.00	March 3, 1901.....	150,000.00
August 3, 1882.....	225,000.00	June 28, 1902.....	200,000.00
July 5, 1884.....	250,000.00	March 3, 1903.....	200,000.00
August 5, 1886.....	187,500.00	March 3, 1905.....	50,000.00
August 11, 1888.....	180,000.00	March 2, 1907.....	100,000.00
September 19, 1890.....	180,000.00	March 4, 1907.....	75,000.00
July 13, 1892.....	150,000.00	Received from other sources .....	7,693.28
August 18, 1894.....	125,000.00		
June 3, 1896.....	50,000.00	Total.....	3,163,193.28
June 3, 1896.....	83,000.00		
June 4, 1907.....	200,000.00		

## CONTRACTS IN FORCE.

CONTRACT FOR BUILDING LOCK AND DAM NO. 11, KENTUCKY RIVER, KENTUCKY.

Name of contractor: H. E. Talbott &amp; Co.

Date of approval: October 19, 1903.

Date of beginning: Within thirty days after date of notification of approval of contract.

Date of expiration: January 1, 1907.

Items.	Contract price (unit rate).
Cofferdam timber .....	M feet B. M. \$39.00
Timber in permanent construction.....	do. 50.00
Piling.....	linear foot. .40
Cofferdam filling.....	cubic yard. .45
Embankment.....	do. .40
Earth excavation.....	do. .45
Rock excavation.....	do. 2.50
Deposit.....	do. .50
Concrete.....	do. 4.65
Armored concrete exclusive of steel.....	do. 4.95
Riprap.....	do. 1.70
Rough paving.....	do. 50.00
Stone masonry.....	do. .07
Iron and steel.....	pound. .05
Driftbolts.....	do. .80
Fence.....	linear foot. .50
Tile drain.....	do. .50

Completed.

NOTE.—The above contract has been modified as indicated in the following supplemental articles of agreement:

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Supplemental contract dated September 28, 1905, approved October 31, 1905, provides for the substitution of armored concrete pavement at Lock No. 11, Kentucky River, for that of rough paving contemplated in the original contract with H. E. Talbott & Co., dated September 28, 1903; payment to be made at the rate of \$7.25 per cubic yard.

Supplemental contract dated March 31, 1906, approved April 30, 1906, provides for the construction of a movable dam, etc., on crest of fixed dam at Lock No. 11, Kentucky River, in lieu of the fixed type of dam contemplated in the original contract with H. E. Talbott & Co., dated September 28, 1903, payment to be made as follows:

Items.	Contract price (unit rate).
Iron and steel ..... pound.....	\$0.095
Timber in permanent construction ..... M feet B. M.....	50.00
Concrete ..... cubic yard.....	4.65
Rock excavation ..... do.....	2.50

Completed.

## CONTRACT FOR FURNISHING ABOUT 14,000 BARRELS AMERICAN PORTLAND CEMENT AT RICHMOND, KY., FOR USE AT LOCK NO. 11, KENTUCKY RIVER.

Name of contractor: Virginia Portland Cement Company.

Date of approval: August 18, 1905.

Date of beginning and date of expiration: The cement must be delivered as required in lots of from 1 to 8 carloads each within fifteen days after receipt of order; to terminate at the end of the working season of 1906.

Item.	Contract price.
American Portland cement, Old Dominion brand (8,400 barrels minimum, 19,600 barrels maximum), delivered f. o. b. cars Richmond, Ky., in cloth or canvas sacks..... per barrel.....	\$1.97
Rebate allowed on empty bags returned..... per bag.....	.10

Completed.

## CONTRACT FOR BUILDING LOCK AND DAM NO. 12, KENTUCKY RIVER, KENTUCKY.

Name of contractor: The Ohio River Contract Company.

Date of approval: July 6, 1907.

Date of beginning: Within twenty days after date of notification of approval of contract.

Date of expiration: November 30, 1909.

Item.	Contract price (unit rate).
Earth excavation ..... cubic yard.....	\$0.35
Rock excavation..... do.....	2.00
Embankment..... do.....	.47
Ballast..... do.....	1.35
Concrete..... do.....	5.00
Paving..... do.....	6.50
Derrick stones..... ton.....	2.50
Riprap..... square yard.....	2.50
Cement..... barrel.....	2.40
Timber..... M feet B. M.....	100.00
Shoring..... do.....	100.00
Iron and steel..... pound.....	.074
Gauges..... linear foot.....	2.00
Drains..... do.....	.45
Fencing..... do.....	.20

CONTRACT FOR BUILDING TWO DWELLINGS, TWO OUTBUILDINGS, TWO CISTERNS, ONE OFFICE BUILDING, AND ONE WELL AT LOCK NO. 12, KENTUCKY RIVER, KENTUCKY.

Name of contractor: William Preston Eckley.

Date of approval: July 3, 1907.

Date of beginning and date of expiration: Within ten days after date of notification of approval of contract, and be completed on or before October 31, 1907.

Item.	Contract price (unit rate).
Excavation.....cubic yard..	\$0.40
Concrete.....do.....	7.00
Well.....linear foot.....	2.10
Timber work.....M feet B. M.....	24.00
Drains.....linear foot.....	.20
Dwellings.....each.....	2,650.00
Outbuildings.....do.....	316.00
Office building.....	375.00
Cisterns.....each.....	120.00

### H H 6.

#### OPERATING AND CARE OF LOCKS AND DAMS ON KENTUCKY RIVER, KENTUCKY.

Under allotments from the indefinite appropriation for operating and care of locks and dams and other works of navigation there has been expended during the year the sum of \$178,025.73.

The following work, in addition to the ordinary dredging and lock operation, was done during the year:

*Lock No. 1.*—Made minor repairs to lock dwelling.

*Lock No. 2.*—Made minor repairs to lock dwellings and outbuildings.

*Lock No. 3.*—Made minor repairs to the lock dwellings.

*Lock No. 4.*—Made minor repairs to the lock dwellings. Replaced decayed and torn-off sheeting of dam; the total amount of timber placed was 7,000 feet B. M. of 10 by 10 inch yellow pine.

*Lock No. 5.*—Made minor repairs to lock dwellings. Replaced torn-off sheeting of dam; the total amount of timber placed was 12,500 feet B. M. of 10 by 10 inch yellow pine. Built up with concrete the isolated piers below river wall of lock and closed the space with a curtain of concrete; the total amount of concrete placed was 343 cubic yards. The gates constructed of steel under contract with The Riverside Bridge Company, of Wheeling, W. Va., to replace the upper wooden lock gates, have been delivered and at the close of the year are being assembled by the contractors. Material has been purchased and delivered for reconstructing in concrete the upper miter sill of lock; this work will be undertaken when the new gates are ready to be placed in position. The remaining portion of the old wall below the roadway has been removed and the bank sloped off.

*Lock No. 6.*—Made minor repairs to the lock dwellings. Reconstructed in concrete above sound timbers the upper land wall of lock; the total amount of concrete placed was 217 cubic yards. Reconstructed in concrete above sound timbers the upper river wall of lock; the total amount of concrete placed was 150 cubic yards. Overhauled and repaired the upper and lower valves in river wall of lock.

*Lock No. 7.*—Made minor repairs to lock dwellings, and reconstructed above pool level the lower lock gates.

*Lock No. 8.*—Made minor repairs to lock dwellings. Replaced decayed and torn-off sheeting of dam; for this purpose 1,750 feet B. M. of 10 by 10 inch yellow pine timber was used.

*Lock No. 9.*—The repairs to the washout around this lock, caused by the flood of March, 1905, were in progress at the beginning of the year, and completed and the lock opened to navigation November 23, 1906. This work was done by hired labor. The amount expended on this work during the year was \$24,400.35.

*Lock No. 10.*—The work of repairing the damage to this lock caused by the flood of March, 1905, under contract with Mr. Frank J. Cullen, of Chicago, Ill., dated April 19, 1906, was in progress at the beginning of the year and, with the exception of the construction of a flag pole, was completed June 30, 1907. The lock was opened to navigation December 22, 1906.

The following is a statement of work done during the year:

Classification.	Quantities.	Price.	Amount.
Excavation.....cubic yards..	6,621.6	\$0.57	\$3,774.81
Embankment.....do.....	22,657.5	.58	12,008.48
Concrete.....do.....	5,832.3	6.25	36,451.88
Stone filling.....do.....	6,528	1.80	11,750.40
Riprap.....do.....	1,162.9	3.75	4,360.88
Timber.....feet B. M.....	483,376	55.00	26,585.68
Iron and steel.....pounds..	6,099.7	.10	609.97
Driftbolts.....do.....	28,210	.05	1,410.50
New dwelling house.....number..	1	.....	2,400.00
Office building.....do.....	1	.....	300.00
Cisterns.....do.....	2	100.00	200.00
Repairs to dwelling.....do.....	1	.....	1,000.00
Repairs to outhouse.....do.....	1	.....	75.00
Unskilled labor.....hours..	523.9	.15	78.59
Total .....	.....	.....	101,005.69

*Lock No. 11.*—The operating expenses of this lock were assumed by this appropriation January 1, 1907. Considerable damage was done to the movable crest of Dam No. 11 by loose logs and drift. Contemplated repairs will be made with a view of preventing similar damage in the future.

The U. S. steamer *General O. M. Poe* was employed during the working season as dredge tender, transporting and towing supplies and material for the various locks, making inspection trips, and assisting in the repair work. Repairs were made to her machinery, hull, and upper works.

Number of miles run .....	3,304
Number of dredges, scows, and crafts towed.....	238
Number of miles towed dredges, scows, etc.....	1,823
Number of snags removed.....	26

The U. S. dredge *No. 1* was employed during the working season in assisting in repair work at the various locks, removing deposit from locks entrances, and dredging the channels. The total amount excavated was 36,230 cubic yards, at an average cost of \$0.1433 per cubic yard.

The U. S. dredge *No. 2* was employed during the working season in assisting in the repair work at locks 7 and 9 and removing deposit



from lock entrances and lock pits. The total amount excavated was 10,120 cubic yards, at an average cost of \$0.3444 per cubic yard.

*U. S. launch Pearl.*—The launch was employed throughout the year in towing dredges, scows, and barges when the services of the steamer *Poe* were not available, making inspection trips, and distributing supplies to the various locks. Repairs were made to the machinery, hull, and cabin.

Total number of miles run..... 3,886

Minor repairs were made to the derrick boats, quarter boats, barges, and scows, and under date of May 24, 1907, a contract was made with the Monongahela River Consolidated Coal and Coke Company, of Pittsburg, Pa., for the construction of two new dump scows, at a total cost of \$6,216.

*Summary of expenditures for operating and care of locks and dams on Kentucky River, Kentucky, for fiscal year ending June 30, 1907.*

Services .....	\$64,054.12
Supplies .....	3,831.75
Material .....	103,678.05
Miscellaneous expenses .....	3,442.07
Fuel .....	3,019.74
<b>Total.....</b>	<b>178,025.73</b>

ALLOTMENTS.

July, 1884 .....	\$15,000.00	July 29, 1899.....	\$63,884.24
July, 1885 .....	27,615.00	May 11, 1900.....	2,500.00
July 31, 1886.....	33,965.00	July 17, 1900.....	82,284.00
July, 1887 .....	79,862.14	July 9, 1901.....	109,137.49
July, 1888 .....	82,478.50	August 19, 1901.....	952.00
July 28, 1889.....	72,394.80	February 4, 1902.....	19,000.00
July 17, 1890.....	28,889.07	July 22, 1902.....	79,634.91
July 16, 1891.....	36,331.38	July 20, 1903.....	56,971.61
November 28, 1891.....	1,112.50	July 13, 1904.....	56,953.04
December 14, 1891.....	11,382.80	May 18, 1905.....	10,000.00
July 15, 1892.....	38,503.62	July 17, 1905.....	112,480.53
June 13, 1893 .....	2,000.00	October 12, 1905.....	15,867.00
July 14, 1893.....	73,065.02	February 28, 1906.....	117,305.00
July 16, 1894.....	46,435.28	July 28, 1906.....	74,816.64
July 20, 1895.....	59,120.04	Received from other	
July 24, 1896.....	70,198.85	sources .....	288.59
August 2, 1897.....	49,272.11		
July 15, 1898.....	53,531.39	<b>Total.....</b>	<b>1,583,232.64</b>

CONTRACTS IN FORCE.

CONTRACT FOR CONSTRUCTING A DAM WITH ABUTMENT AND PROTECTION CRIB, A DIKE, ONE DWELING HOUSE, ONE OFFICE BUILDING, TWO CISTERNS, AND REPAIRS TO OLD DWELLING AND TWO OUTHOUSES AT LOCK NO. 10, KENTUCKY RIVER, AT FORD, KY.

Name of contractor: Frank J. Cullen.

Date of approval: April 28, 1906.

Date of beginning and date of expiration: To be commenced on or before May 31, 1906, and to be completed on or before December 31, 1906.

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Item.	Contract price.
Excavation.....cubic yard..	\$0. 57
Embankment.....do.....	. 58
Concrete.....do.....	6. 25
Stone filling.....do.....	1. 80
Riprap.....do.....	3. 75
Timber.....M. feet, B. M.....	55. 00
Iron and steel.....pound.....	. 10
Drift bolts.....do.....	. 05
Dwelling house.....	2, 400. 00
Office.....	300. 00
Cisterns.....each.....	100. 00
Repairs to old buildings:	
Dwelling house.....	1, 000. 00
Outbuildings.....each.....	75. 00

CONTRACT (EMERGENCY) FOR RENT OF STRIP OF LAND AT SPEARS, KY., BETWEEN A SIDE TRACK OF THE LOUISVILLE AND ATLANTIC RAILROAD, FOR THE PURPOSE OF UNLOADING MATERIAL DURING THE TIME REPAIRS ARE BEING MADE TO LOCK NO. 9, KENTUCKY RIVER, KENTUCKY.

Name of contractor: O. T. Soper.

Date of approval: (Emergency contract.)

Date of beginning and date of expiration: To begin immediately after execution of contract, and to terminate when repairs are completed and side track removed.

Item.	Contract price.
Rent of strip of land at Spears, Ky.....	\$100

Completed.

CONTRACT (EMERGENCY) FOR STEEL LOCK GATES FOR LOCK NO. 5, KENTUCKY RIVER, KENTUCKY.

Name of contractor: Riverside Bridge Co.

Date of approval: (Emergency contract.)

Date of beginning and date of expiration: To be commenced within 10 days after date of signature of contract, and to be completed on or before March 30, 1907.

Item.	Contract price (unit rate).
Steel lock gates for Lock No. 5, Kentucky River.....pound..	\$0. 05 <sup>75</sup> / <sub>100</sub>

CONTRACT FOR CONSTRUCTING AND DELIVERING TWO DUMP SCOWS.

Name of contractor: The Monongahela River Consolidated Coal and Coke Company.

Date of contract: June 13, 1907.

Date of beginning and date of expiration: To commence within 10 days after date of notification of approval of contract, and to be completed within 75 days after such notification.

Item.	Contract price.
For constructing and delivering 2 dump scows at Lock No. 1, Kentucky River.....each..	\$8, 108

## CONTRACT FOR FURNISHING AND DELIVERING ABOUT 3,400 BARRELS OF AMERICAN PORTLAND CEMENT FOR REPAIRS AT LOCK NO. 9.

Name of contractor: Virginia Portland Cement Company.

Date of approval: September 27, 1905.

Date of beginning and date of expiration: Delivery required as ordered in lots of from one to eight carloads each; contract may extend to end of season of 1906.

Item.	Contract price per barrel, in bags.
Old Dominion Portland cement:	
3,400 barrels, in bags, delivered f. o. b. Valley View, Ky.....	\$2.01
Rebate allowed on empty bags returned to point of delivery.....	.10

Completed.

## COMMERCIAL STATISTICS.

Statement of traffic passing the locks on Kentucky River during the calendar years 1903, 1904, 1905, and 1906.

Lock—	Passenger boats.				Towboats.				Government boats.			
	1903	1904	1905	1906	1903	1904	1905	1906	1903	1904	1905	1906
No. 1.....	567	407	418	489	189	294	390	744	8	68	8	16
No. 2.....	478	386	379	482	150	252	309	601	33	71	27	26
No. 3.....	239	169	155	192	131	219	266	876	90	95	49	26
No. 4.....	318	199	159	183	180	269	352	477	171	197	62	41
No. 5.....	215	153	139	89	66	219	323	361	60	44	64	79
No. 6.....	228	128	104	88	50	200	278	278	44	46	56	45
No. 7.....	294	120	108	86	49	208	261	240	35	34	52	46
No. 8.....	171	98	67	87	22	128	157	139	24	31	57	48
No. 9.....		44	4		1	98	309	27			11	6
No. 10.....							31	51			12	
Total.....	2,506	1,704	1,583	1,696	768	1,877	2,676	3,299	465	608	398	333

Lock—	Coal barges.				Other barges.				Small crafts.			
	1903	1904	1905	1906	1903	1904	1905	1906	1903	1904	1905	1906
No. 1.....	170	116	222	256	325	288	217	237	56	47	40	28
No. 2.....	152	86	185	217	213	233	186	220	71	48	41	58
No. 3.....	149	92	166	200	256	699	169	188	81	51	69	78
No. 4.....	152	92	178	212	239	307	189	236	142	90	70	162
No. 5.....	42	28	42	28	287	177	197	204	71	48	59	71
No. 6.....	21	28	11	15	220	191	197	148	290	128	81	92
No. 7.....	19	10	12	18	270	199	149	113	101	128	95	108
No. 8.....	12		2		190	158	128	65	85	112	44	82
No. 9.....				1	2	245	27	105	5	145	1,556	17
No. 10.....				1			15	17			4	6
Total.....	717	442	818	948	2,102	2,492	1,474	1,526	902	797	2,069	702

Lock—	Rafts.				Total.				Increase + decrease —over 1905.	
	1903.	1904.	1905.	1906.	1903.	1904.	1905.	1906.		
No. 1.....	656	818	726	757	1,921	2,083	2,021	2,527	+	506
No. 2.....	644	822	689	682	1,736	1,998	1,816	2,486	+	670
No. 3.....	664	792	713	662	1,610	2,117	1,687	1,722	+	135
No. 4.....	686	844	700	659	1,968	1,998	1,710	1,970	+	260
No. 5.....	1,514	1,272	2,097	1,373	2,255	1,941	2,921	2,206	—	716
No. 6.....	1,536	1,288	2,559	1,641	2,389	2,009	8,086	2,297	—	799
No. 7.....	1,342	1,859	2,282	1,652	2,110	2,063	2,959	2,263	—	696
No. 8.....	1,832	1,728	2,360	1,809	2,386	2,250	2,815	2,230	+	585
No. 9.....		1,857	2,206	1,774	8	2,406	4,113	1,980	—	2,133
No. 10.....			1,815	1,509	.....	.....	1,877	1,584	—	123
Total.....	8,874	10,780	15,947	12,508	16,333	18,705	24,905	21,214	—	3,691

# 1790 REPORT OF THE CHIEF OF ENGINEERS, U. S. ARMY.

## Statement of traffic passing the locks on Kentucky River, etc.—Continued.

Lock—	Total tonnage.				Increase + or decrease —over 1906.	Lockages.				Increase + or decrease —over 1906.
	1908.	1904.	1905.	1906.		1908.	1904.	1905.	1906.	
No. 1...	204,953	186,940	213,024	227,359	+ 14,385	1,201	1,356	1,386	1,796	+ 410
No. 2...	181,203	166,776	189,125	224,989	+ 35,864	1,161	1,391	1,391	2,467	+ 1,076
No. 3...	176,507	230,278	164,692	181,995	+ 17,303	1,183	1,554	1,182	1,307	+ 125
No. 4...	189,901	174,560	166,443	194,722	+ 28,279	1,429	1,415	1,300	1,488	+ 188
No. 5...	188,071	161,517	225,517	172,272	— 58,245	1,398	1,169	1,632	1,233	— 399
No. 6...	178,264	153,250	235,597	172,717	— 62,880	1,215	1,092	1,370	1,086	— 284
No. 7...	162,880	163,932	220,790	165,988	— 54,802	1,029	992	1,478	1,063	— 415
No. 8...	178,212	174,094	202,052	160,252	— 41,800	924	1,001	1,086	1,000	— 85
No. 9...	342	169,807	189,592	156,613	— 32,979	3	1,031	23	189	+ 166
No. 10...			165,638	123,961	— 31,687			40	4	— 36
Total.	1,460,333	1,581,154	1,962,470	1,780,878	— 181,592	9,543	11,001	10,887	11,633	+ 746

## Statement of commerce, in tons, passing the locks on Kentucky River, Kentucky, during the calendar years 1903, 1904, 1905, and 1906.

### LOCK NO. 1.

Articles.	1903.	1904.	1905.	1906.
Coal.....	47,933	32,441	67,135	73,217
Grain.....	3,985	4,086	2,742	5,174
Salt.....	504	464	720	711
Oil.....	358	308	319	321
Whisky.....	1,357	1,948	2,221	1,384
Flour.....	2,264	1,943	1,584	2,074
Sugar.....	315	292	279	315
Molasses.....	55	40	56	27
Cement.....	292	587	400	2,147
Tobacco.....	2,902	2,339	3,435	4,163
Hay.....	1,014	766	428	1,308
Live stock.....	1,139	784	670	518
Lumber and timber.....	52,443	74,562	83,181	80,285
Shingles.....	184	81	74	71
Manufactured iron.....	208	271	137	490
Produce.....	106	104	85	68
General and miscellaneous.....	10,663	5,871	6,269	11,576
Total.....	126,722	126,284	169,685	184,244
Number of passengers.....	7,822	7,592	8,941	12,045

### LOCK NO. 2.

Articles.	1903.	1904.	1905.	1906.
Coal.....	43,450	25,556	58,490	66,086
Grain.....	8,457	3,650	1,956	4,959
Salt.....	341	230	403	509
Oil.....	204	210	161	289
Whisky.....	1,349	1,404	2,126	1,448
Flour.....	1,584	1,317	990	1,457
Sugar.....	151	183	140	214
Molasses.....	35	17	21	6
Cement.....	193	855	252	225
Tobacco.....	1,691	1,575	2,178	2,257
Hay.....	212	626	133	948
Live stock.....	687	409	385	586
Lumber and timber.....	52,905	73,937	79,358	65,140
Shingles.....	65	29	15	36
Manufactured iron.....	171	215	75	349
Produce.....	100	56	33	77
General and miscellaneous.....	7,179	4,189	4,121	10,154
Total.....	118,674	114,007	150,832	184,699
Number of passengers.....	5,865	4,998	6,279	6,239

Statement of commerce, in tons, passing the locks on Kentucky River, etc.—Cont'd.

## LOCK NO. 3.

Articles.	1903.	1904.	1905.	1906.
Coal.....	40,850	23,732	56,536	63,484
Grain.....	3,255	3,645	2,011	4,650
Salt.....	174	119	124	98
Oil.....	87	125	87	131
Whisky.....	1,351	1,333	2,096	1,403
Flour.....	1,040	887	631	971
Sugar.....	70	85	53	127
Molasses.....	19	13	13	10
Cement.....	367	201	173	192
Tobacco.....	614	569	1,077	925
Hay.....	162	443	32	943
Live stock.....	400	290	274	419
Lumber and timber.....	51,577	67,124	71,738	65,013
Shingles.....	85	10	7	7
Manufactured iron.....	135	250	61	235
Produce.....	40	50	25	38
General and miscellaneous.....	4,416	2,404	2,367	7,623
Total.....	104,592	101,280	137,306	146,269
Number of passengers.....	4,773	3,708	5,034	4,014

## LOCK NO. 4.

Coal.....	42,353	23,350	55,592	62,619
Grain.....	3,293	3,361	2,015	4,802
Salt.....	139	81	134	103
Oil.....	84	76	87	96
Whisky.....	1,303	1,173	2,133	1,454
Flour.....	947	671	565	907
Sugar.....	57	71	53	96
Molasses.....	12	7	13	7
Cement.....	269	188	155	149
Tobacco.....	193	229	455	282
Hay.....	141	489	20	1,019
Live stock.....	221	110	115	211
Lumber and timber.....	51,368	70,229	71,220	65,491
Shingles.....	31	15	5	6
Manufactured iron.....	132	239	24	173
Produce.....	31	22	26	32
General and miscellaneous.....	4,022	1,811	1,587	6,373
Total.....	104,596	102,122	134,249	143,819
Number of passengers.....	4,787	3,931	5,708	4,442

## LOCK NO. 5.

Coal.....	10,001	7,119	15,447	10,830
Grain.....	2,715	3,212	1,742	2,953
Salt.....	79	46	102	106
Oil.....	18	36	30	32
Whisky.....	1,230	1,200	2,262	1,374
Flour.....	167	181	147	247
Sugar.....	16	26	10	24
Molasses.....	8	2	4	.....
Cement.....	43	124	43	42
Tobacco.....	158	166	94	186
Hay.....	147	291	11	63
Live stock.....	183	102	66	125
Lumber and timber.....	105,051	114,105	174,478	118,686
Shingles.....	.....	5	9	4
Manufactured iron.....	113	17	8	79
Produce.....	10	10	10	5
General and miscellaneous.....	6,701	976	926	1,071
Total.....	126,695	127,618	195,389	135,832
Number of passengers.....	4,016	3,495	3,317	3,597

# 1792 REPORT OF THE CHIEF OF ENGINEERS, U. S. ARMY.

Statement of commerce, in tons, passing the locks on Kentucky River, etc.—Cont'd.

LOCK NO. 6.

Articles.	1903.	1904.	1905.	1906.
Coal.....	4,186	4,439	5,187	5,976
Grain.....	2,728	3,163	1,667	3,286
Salt.....	81	37	99	96
Oil.....	18	26	19	22
Whisky.....	1,256	698	867	1,049
Flour.....	162	97	103	136
Sugar.....	15	17	4	15
Molasses.....	3		3	
Cement.....	88	92	58	21
Tobacco.....	52	25	90	118
Hay.....	122	188		64
Live stock.....	176	47	68	124
Lumber and timber.....	114,680	112,973	192,680	123,509
Shingles.....	2	4	4	4
Manufactured iron.....	112	27	3	60
Produce.....	10	7	5	5
General and miscellaneous.....	3,240	690	663	651
Total.....	126,881	122,430	201,510	145,180
Number of passengers.....	4,814	3,077	6,077	3,670

LOCK NO. 7.

Coal.....	3,885	3,700	4,065	5,735
Grain.....	2,467	3,011	1,644	2,885
Salt.....	56	26	66	90
Oil.....	69	19	13	20
Whisky.....	1,197	602	844	979
Flour.....	106	57	84	112
Sugar.....	8	11	3	9
Molasses.....			2	
Cement.....	22	69	12	68
Tobacco.....	11	10	25	80
Hay.....	128	159		55
Live stock.....	139	39	69	117
Lumber and timber.....	101,149	123,218	187,522	128,286
Shingles.....			7	4
Manufactured iron.....	107	12	3	41
Produce.....				
General and miscellaneous.....	1,684	718	584	678
Total.....	111,023	181,651	194,963	139,154
Number of passengers.....	4,462	2,996	7,805	2,770

LOCK NO. 8.

Coal.....	1,570	276	683	502
Grain.....	92	199	1	97
Salt.....	80	12	68	16
Oil.....	4	10	10	19
Whisky.....	8		51	52
Flour.....	56	28	50	69
Sugar.....	1	4		16
Molasses.....				
Cement.....	95	69	7	36
Tobacco.....	10		23	64
Hay.....		20	1	2
Live stock.....	93	24	35	97
Lumber and timber.....	129,798	148,307	177,496	127,630
Shingles.....			9	1
Manufactured iron.....	101	11	3	19
Produce.....				2
General and miscellaneous.....	388	429	429	390
Total.....	132,236	149,889	178,856	128,962
Number of passengers.....	3,447	2,779	4,457	2,254

*Statement of commerce, in tons, passing the locks on Kentucky River, etc.—Con.*

## LOCK NO. 9.

Articles.	1903.	1904.	1905.	1906.
Coal .....		151		42
Oil .....		8	1	
Live stock .....		2		
Lumber and timber .....	40	148,787	184,185	140,827
Manufactured iron .....		7		
General and miscellaneous .....	2	831	801	
Total .....	42	149,286	184,437	140,869
Number of passengers .....	14	1,448	18	80

## LOCK NO. 10.

Oil .....			1	
Lumber and timber .....			158,099	121,188
General and miscellaneous .....			829	
Total .....			158,429	121,188
Number of passengers .....			1	

*Tons of commerce.*

Lock—	1903.	1904.	1905.	1906.
No. 1 .....	125,722	126,284	169,685	184,244
No. 2 .....	113,674	114,007	150,832	154,699
No. 3 .....	104,592	101,280	137,305	146,269
No. 4 .....	104,596	102,122	134,249	143,819
No. 5 .....	126,695	127,618	195,389	185,882
No. 6 .....	126,881	122,480	201,510	145,180
No. 7 .....	111,023	181,651	194,963	189,154
No. 8 .....	182,286	149,389	178,866	128,562
No. 9 .....	42	149,236	184,437	140,869
No. 10 .....			158,429	121,188

*List of boats plying the Kentucky River, Kentucky, during calendar year ending December 31, 1906.*

Name of boat.	Character.	Length.	Breadth.	Depth.	Tonnage.
		<i>Feet.</i>	<i>Feet.</i>	<i>Feet.</i>	
General O. M. Poe .....	U. S. towboat .....	145.00	34.0	4.6	150.00
Pearl .....	U. S. launch .....	40.00	8.0	4.0	5.00
Falls City .....	Packet .....	151.67	36.0	4.4	235.00
Cando .....	do .....	117.60	19.6	3.2	74.00
White Dove .....	do .....	65.00	14.0	3.0	35.00
Daisy .....	do .....	49.00	9.8	4.2	11.00
Mountain State .....	Towboat .....	143.70	28.0	3.5	142.00
Major Black .....	do .....	148.00	26.1	4.5	98.00
John Mackey .....	do .....	140.00	22.5	4.0	100.00
Nellie Willett .....	do .....	122.50	28.0	4.0	98.00
Mary Stewart .....	do .....	100.00	20.0	3.2	91.92
Concrete .....	do .....	95.00	17.0	3.4	58.00
Nellie England .....	do .....	90.00	18.0	3.0	82.00
Mabel .....	do .....	80.00	17.0	3.5	49.00
Alys Gray .....	do .....	73.00	12.8	3.0	32.00
Nettie Grant .....	do .....	69.00	12.0	3.0	20.00
Blue Wing .....	do .....	62.00	11.0	1.5	40.00
Louise .....	do .....	60.40	9.5	2.0	9.00
Marguerite .....	do .....	59.00	10.0	2.0	13.00
Lucile .....	do .....	55.00	12.0	2.0	14.00
Fannie .....	do .....	55.00	11.0	2.4	10.00
Willie B .....	do .....	50.00	10.0	2.5	10.00
Dove .....	do .....	47.00	8.0	1.5	18.00
Basil .....	do .....	45.00	9.0	1.5	7.00

## 1794 REPORT OF THE CHIEF OF ENGINEERS, U. S. ARMY.

*List of boats plying the Kentucky River, Kentucky, etc.—Continued.*

Name of boat.	Character.	Length.	Breadth.	Depth.	Tonnage.
		<i>Feet.</i>	<i>Feet.</i>	<i>Feet.</i>	
Champion.....	Sawmill boat.....	90.00	28.0	4.5	69.00
Dixie.....	Pleasure boat.....	86.00	16.0	3.0	35.00
Shamrock.....	do.....	56.00	10.0	3.0	9.00
Alice.....	do.....	56.00	12.0	2.0	7.00
Ollie.....	do.....	54.00	11.8	3.0	34.00
Charler.....	do.....	50.00	12.0	2.0	13.00
S. and F. Sawyer.....	do.....	40.00	11.0	2.0	9.00
Outing.....	do.....	40.00	9.5	2.5	9.00
Williamette.....	do.....	40.00	8.0	3.6	10.00
Gazebo.....	do.....	40.00	7.0	2.5	3.00
Itsky.....	do.....	37.50	9.5	3.0	4.00
The Indian.....	do.....	36.00	8.0	2.0	5.00
Rescue.....	do.....	35.00	8.0	4.0	3.00
Cleette.....	do.....	35.00	8.0	4.0	3.00
Martha.....	do.....	35.00	7.0	3.0	3.00
Pomona.....	do.....	35.00	8.0	4.0	3.00
Merry Houston.....	do.....	32.00	8.0	4.6	4.00
Helen.....	do.....	32.00	7.0	2.5	3.00
Shellreef.....	do.....	31.00	6.0	4.0	3.00
Ida.....	do.....	30.00	8.0	3.5	2.00
Starlight.....	do.....	30.00	7.5	3.0	4.50
Drennon Springs.....	do.....	30.00	7.0	5.0	2.00
Hazel D.....	do.....	30.00	6.0	4.0	2.00
Ruth.....	do.....	30.00	6.0	3.0	2.50
Big Four.....	do.....	26.00	5.5	3.5	3.00
Princess.....	do.....	22.50	5.0	3.0	1.50
Onward.....	do.....	22.00	6.0	3.0	2.00
Minerva.....	do.....	22.00	5.0	3.0	1.50
Wood Brothers.....	do.....	22.00	5.0	2.2	2.00
Mabel.....	do.....	21.00	4.8	3.0	1.50
Raymond.....	do.....	21.00	4.8	2.5	1.50
Hazel.....	do.....	20.00	5.0	2.5	1.00
Solite.....	do.....	20.00	5.0	2.5	1.00
Albert, Jr.....	do.....	20.00	4.6	1.1	1.00
F. Smith.....	do.....	18.00	5.0	3.0	1.00
Wignotte.....	do.....	18.00	4.8	3.0	1.50
Cheyenne.....	do.....	18.00	4.5	3.0	1.00
J. F.....	do.....	17.00	4.1	2.5	1.00
Florence.....	do.....	16.00	4.2	3.0	1.50
Bernadotte.....	do.....	16.00	3.5	3.0	1.00
Pocahontas No. 3.....	do.....				
James A. Doyle.....	do.....				
Sally Keno.....	do.....				
Igo.....	do.....				
Uncle Jim.....	do.....				
George.....	do.....				
Dorothy.....	do.....				
Tina.....	do.....				
Alma.....	do.....				
Sprite.....	do.....				
Magnolia.....	do.....				

NOTE.—Where no dimensions are given the boats are small gasoline launches.

*List of leases in force during the fiscal year ending June 30, 1907, Kentucky River, Kentucky.*

Location.....	Lock No. 4.
Lessee.....	Kentucky River Mills.
Date.....	July 10, 1878.
Expires.....	July 10, 1977.
Annual rental.....	\$180 per year.



## APPENDIX I I.

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### IMPROVEMENT OF FALLS OF THE OHIO RIVER; OF WHITE RIVER, INDIANA; OF WABASH RIVER, INDIANA AND ILLINOIS; AND OF CERTAIN RIVERS IN KENTUCKY.

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REPORT OF CAPT. H. BURGESS, CORPS OF ENGINEERS, OFFICER IN CHARGE, FOR THE FISCAL YEAR ENDING JUNE 30, 1907.

#### IMPROVEMENTS.

- |  |   |
|--|---|
| 1. Falls of Ohio River at Louisville, Kentucky.                      | 6. Green River, above the mouth of Big Barren River, Kentucky.                |
| 2. Operating and care of Louisville and Portland Canal, Kentucky.    | 7. Operating and care of locks and dams on Green and Barren rivers, Kentucky. |
| 3. Wabash River, Indiana and Illinois.                               | 8. Rough River, Kentucky.   |
| 4. Operating and care of lock and dam at Grand Rapids, Wabash River. | 9. Operating and care of lock and dam on Rough River, Kentucky.               |
| 5. White River, Indiana.   |   |
- 

UNITED STATES ENGINEER OFFICE,  
*Louisville, Ky., July 8, 1907.*

GENERAL: I have the honor to transmit herewith annual reports of the works under my charge at the close of the fiscal year ending June 30, 1907.

Very respectfully, your obedient servant,

H. BURGESS,  
*Captain, Corps of Engineers.*

Brig. Gen. A. MACKENZIE,  
*Chief of Engineers, U. S. A.*

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## I I I.

### IMPROVEMENT OF FALLS OF OHIO RIVER AT LOUISVILLE, KENTUCKY.

A condensed description of the original condition, outline of projects, etc., will be found on page 570 of this report; references to more detailed information may be found on page 488, Annual Report of the Chief of Engineers for 1904.

No work was done during the fiscal year except for the inspection and receipt of steel and iron work for the section of Boulé dam

between Middle and Indiana chutes and for the beginning of construction of a service track to the site of this section of the dam. This track was partially constructed in September, when a favorable stage of water seemed probable, but on the approach of a rise in October it was necessary to remove the track in order to save the material. This was the only time during the year when a favorable stage of water even appeared to be probable. During the year the Brackett Bridge Company completed its contract for furnishing trestles, and final settlement was made with the company on March 1, 1907. At present all material except concrete material is on hand for this section of dam, including the wickets, as well as all material for cofferdam. The total expenditure to date from the appropriation of March 3, 1905, of \$80,000 is \$37,417.83, which includes the \$5,000 applied to maintenance, the balance available being \$42,582.17.

#### NEW APPROPRIATION.

The act approved March 2, 1907, contained the following:

Improving the Ohio River at Louisville, Kentucky: By raising the dam so as to give a minimum depth of nine feet upstream to Madison, Indiana, and a minimum depth of six feet on the lower miter sill at Lock Numbered One, Kentucky River, two hundred and seventy-one thousand dollars.

Improving the Ohio River at Louisville, Kentucky: By the removal of rocks in the channel of said river near to the falls, forty-three thousand dollars.

The latter item is to provide for the completion of the rock removal at the enlargement at the head of the canal, as provided for in the project approved April 8, 1899. The former item is for work in addition to the present approved project, and is based on an estimate prepared by me for the use of the Ohio River Board. The work remaining to be done under the present approved project, with the additions thereto, is as follows:

(1) The excavation of rock on the north side of the enlargement at the head of the canal; the estimated quantities remaining to be done are 5,026 cubic yards solid rock to be disrupted and removed by dredging, and 24,962 cubic yards disrupted rock to be removed by dredging.

(2) New wall, south side of canal, including earth excavation, removing old wall and guard gate abutment, and the paving of slopes; all of which has been provided for by allotment for operating and care of Louisville and Portland Canal and has been practically completed. These items would be omitted altogether from this list except for the fact that about 10 per cent of the work has not yet been done.

(3) Submerged stone dam at Whirlpool Point, 2,500 cubic yards, longitudinal dikes of concrete at upper end of Indiana Chute, 22,300 cubic yards; submerged dams of concrete below bridge, 3,000 cubic yards; rock excavation Indiana Chute, 3,200 cubic yards. In view of the other work recommended by the Ohio River Board, that Board recommended that these items of work be omitted.

(4) Replacing about 650 linear feet of existing Boulé dam immediately north of the upper end of the north wall of the Louisville and Portland Canal, and having its crest at +8 upper canal gauge (411.004 above sea level) with a new section of the same type of dam but with a crest elevation of +12.7 feet upper canal gauge (415.704

feet above sea level); estimated cost \$31,000; provided for by the appropriation of March 2, 1907.

(5) Construction of 500 linear feet of Boulé dam in Middle Chute with elevation of crest at +9 upper canal gauge (412.004 feet above sea level), provided for by appropriation of March 2, 1907.

(6) The construction of 1,000 linear feet of Boulé dam with crest elevation at +9 feet upper canal gauge, between Middle and Indiana chutes, to replace the old timber crib dam, which has been practically destroyed, provided for by appropriation of March 3, 1905.

(7) The construction of 648 linear feet of Chanoine dam in Indiana Chute, with crest at +9 feet upper canal gauge, provided for by appropriation of March 2, 1907.

(8) The construction of about 600 linear feet of concrete dam between Indiana Chute and the north bank of the river, with crest elevation at +9 feet upper canal gauge, provided for by the appropriation of March 2, 1907.

#### PRESENT CONDITIONS.

All steel and iron parts, wickets, and sills for the 1,000-foot Boulé section, item 6, are on hand, and contracts have been entered into for the steel and iron parts for the other Boulé sections (items 4 and 5), and the Chanoine section (item 7), and other materials for these sections have been ordered under circular advertisements, a considerable quantity of which material has already been delivered.

The money for item 6 has been available for two seasons, but on account of the very unfavorable river conditions for the past two seasons it has been impossible to begin the construction of this section, although on three occasions materials for railroad track and cofferdam have been assembled and work on the track begun, only to be immediately stopped by a rise in the river. The fall of 1904 was unusually favorable for work on the falls, but then there was no money available, and since the money has been available there has been no season with water sufficiently low for this work.

Upon the passage of the act of March 2, 1907, all plans were made in anticipation of beginning the work immediately upon the occurrence of a favorable stage of the river and vigorously prosecuting the field work with an aim toward completion during the present season. The section of Boulé dam north of the canal (item 4) can be done when the upper canal gauge is between 6 and 7 feet, and with average spring conditions this section would have been completed before June 30. But the months of April, May, and June have brought almost continuous rain, and while the cofferdam was started in May, at present date the coffer is not complete and no work has been done on the dam. On account of this delay it is not expected that all the sections of the dam can be completed this year.

Several other conditions besides those imposed by the river and weather will operate to retard the progress of the work. Among these may be mentioned the provisions of the eight-hour law prohibiting the workmen from rendering more than eight hours' service in a calendar day, even if they are willing to work more hours and receive additional pay therefor. This limitation is a serious drawback to rapid and economical progress of construction when labor is

scarce and the working season, at best, is short. It is extremely difficult to obtain sufficient labor to work even two shifts, and not at all probable that three shifts can be secured. It is also unfortunate for work of this character, located as it is, that the Saturday half holiday granted employees by Executive order must be given during the months when natural conditions for progress are best. This half holiday takes away one-twelfth of the working time at a time when the work should go on without a stop, and of course adds considerably to the cost of the work. It would be desirable to obtain authority to work the entire day, even at double rate of pay. These limitations on the labor also affect the cost of the work by reason of the necessity for reconstruction of cofferdam and track and reinstalling of plant when work has not been completed at the end of the season, as no temporary structures nor plant can be kept in the river during the winter season.

The completion of the rock excavation at the head of the canal is to be done by the canal dredges when the stage of water is favorable and they are not engaged in removing deposit from the canal. It was expected to start the dredges and drills on this work in May, but the repeated rises in the river have made it necessary to keep the dredges at work clearing the canal of the deposits of mud.

An agreement has been reached with the owners of the small tract of land needed on the Indiana shore for the abutment of the concrete section of the dam, and the titles are now being examined by the United States attorney. The slow progress usually made in such examinations is mentioned in the report for "Improvement of Green River, above the mouth of the Big Barren, Kentucky," page 1809 of this report.

#### *Money statement.*

July 1, 1906, balance unexpended.....	\$64, 959. 42
October 17, 1906, from transfer of property.....	350. 00
Amount appropriated by river and harbor act approved March 2, 1907.....	314, 000. 00
	<hr/>
	379, 309. 42
June 30, 1907, amount expended during fiscal year, for works of improvement.....	30, 826. 33
	<hr/>
July 1, 1907, balance unexpended.....	348, 483. 09
July 1, 1907, outstanding liabilities.....	3, 469. 87
	<hr/>
July 1, 1907, balance available.....	345, 013. 22
	<hr/>
July 1, 1907, amount covered by uncompleted contracts.....	53, 850. 47
Amount (estimated) required for completion of existing project.....	429, 215. 99

#### APPROPRIATIONS.

Enlargement at head of canal and of basin at lock:

July 5, 1884.....	\$300, 000. 00
August 5, 1886.....	150, 000. 00
August 11, 1888.....	150, 000. 00
September 19, 1890.....	60, 000. 00
July 13, 1892.....	60, 000. 00
August 18, 1894.....	60, 000. 00
	<hr/>
	\$780, 000. 00

Allotments for Indiana Chute from appropriations for improving  
Ohio River:

July 14, 1880.....	\$10,000.00	
March 3, 1881.....	50,000.00	
August 2, 1882.....	35,000.00	
July 5, 1884.....	10,000.00	
August 5, 1886.....	20,000.00	
August 11, 1888.....	15,000.00	
		\$140,000.00

## Appropriations for work on Indiana Chute:

September 19, 1890.....	\$25,000.00	
July 13, 1892.....	35,000.00	
August 18, 1894.....	20,000.00	
		80,000.00

Net allotment from appropriation for maintenance of river and  
harbor improvements, act of April 28, 1904..... 14,545.06

Net allotment from appropriation for improving Ohio River, gen-  
eral improvement, act of March 3, 1905..... 5,353.80

Appropriations for improving Falls of Ohio River and Indiana  
Chute, Falls of Ohio River:

June 3, 1896.....	\$10,000.00	
June 4, 1897.....	350,000.00	
July 1, 1898.....	152,250.00	
March 3, 1899.....	15,000.00	
June 13, 1902.....	41,000.00	
March 3, 1905.....	80,000.00	
March 2, 1907.....	314,000.00	
		962,250.00
October 17, 1906, sale of property.....		350.00

Total..... 1,982,498.86

## CONTRACTS IN FORCE..

Contractor: Charles Hegewald Company, New Albany, Ind.

Date of contract: April 20, 1907.

For trestles, etc., for Boulé dam, as follows:

[Cents per pound.]

290 wrought-iron deck-connecting frames.....	6.999
290 upstream cast-iron trestle boxes.....	3.249
290 downstream cast-iron trestle boxes.....	3.249
1,160 1½-inch wrought-iron hold-down bolts and nuts.....	4.999
1,160 standard wrought-iron washers for 1½-inch bolts.....	4.499
290 1½-inch wrought-iron upstream trestle-box pins.....	4.999
290 1½-inch wrought-iron downstream trestle-box pins, with standard nuts.....	4.999
580 ½-inch wrought-iron deck-frame bolts, with standard nuts.....	4.999
56 angle bars, 20 feet by 6 inches by ½ inch, 19.6 pounds per foot.....	2.999
4 9-inch I beams, each 10 feet 3 inches long, 21 pounds per foot.....	2.999
280 steel or wrought-iron trestles, with hinge blocks and chain connec- tions attached.....	5.499

Date of approval: April 26, 1907.

Date of beginning work: Within ten days after notice of approval.

Date for completion: August 15, 1907.

Contractor: Grainger & Co., Louisville, Ky.

Date of contract: May 1, 1907.

# 1800 REPORT OF THE CHIEF OF ENGINEERS, U. S. ARMY.

*For steel and iron parts for Chanoine dam.*

	Cents per pound.
168 steel or wrought-iron horses.....	5½
168 steel or wrought-iron props.....	5½
164 cast-iron hurters.....	2½
170 cast-steel horse boxes.....	6½
340 cast-steel horse box keys.....	8½
1 steel or wrought-iron bed plate.....	4½
81 steel or wrought-iron cover plates.....	4½
164 2½-inch steel or wrought-iron hold-down bolts, 4 feet long.....	4
164 2-inch steel or wrought-iron hold-down bolts, 4 feet 9 inches long.....	4
984 1½-inch steel or wrought-iron hold-down bolts, 2½ feet long.....	3½
340 ¾-inch steel or wrought-iron horse box bolts, 5 inches long.....	4½

Date of approval: May 11, 1907.

Date of beginning work: Within 10 days after notice of approval.

Date for completion: October 1, 1907.

## COMMERCIAL STATISTICS.

Commercial statistics are given in the following report for operating and care of the Louisville and Portland Canal.

## I I 2.

### OPERATING AND CARE OF LOUISVILLE AND PORTLAND CANAL KENTUCKY.

Description of original condition and references to former reports, documents, etc., will be found on page 491, Annual Report of the Chief of Engineers for 1904.

The project and estimate for the fiscal year ending June 30, 1907, approved July 13, 1906, provided as follows:

It is proposed to operate the canal and locks and to make such repairs as may from time to time become necessary to maintain them in good navigable condition; to operate the dredging outfit as needed in clearing the canal and locks, etc., of deposit brought into them by high water; to make such repairs to the towboat, dredges, buildings, walls, slopes, pavements, roadways, bridges, fences, and other Government property, as are necessary to maintain them in good condition; to construct a new dredge; to install new machinery on dredge *Wabash*; and to complete the construction of the south canal wall and revetment above the canal basin at the Byrne & Speed Coal Company's elevator.

The estimate for the year is summarized as follows:

Regular force and extra labor.....	\$55,684.00
Repairs .....	11,500.00
Construction of new dredge.....	7,050.40
New machinery, dredge <i>Wabash</i> .....	3,800.00
Completing south canal wall.....	39,949.06
Miscellaneous, supplies, and contingencies.....	12,000.00
Total .....	129,983.46

Under the foregoing project and estimate the operations during the fiscal year, in addition to the usual work of passing traffic and ordinary current repairs incident to care and preservation, were as follows: The dredging plant removed from the canal 224,399 cubic

yards mud, 10 cubic yards loose rock, from channel below locks; from the basin used by the Speed Elevator Company, 4,680 cubic yards mud; from the city wharf, 2,770 cubic yards mud and cinders, and from in front of south canal wall and end of concrete dam, 12,060 cubic yards mud and rock. The cost of the dredging in the basin was borne by the Byrne & Speed Coal Company, that of the work at the city wharf by the city of Louisville, Ky. Expenditures from the item "Regular force" in the allotment amounted to \$43,887.98.

*Miscellaneous repairs.*—These included the numerous items of current work of a minor character necessary to keep the various boats, buildings, bridges, roadways, fences, slopes, grounds, lock gates, lock machinery, lighting plant, shop machinery, etc., in good serviceable condition. Expenditures on this account amounted to \$19,465.01.

*New combined hydraulic dredge and derrick boat.*—A general description of this boat is given in last year's report. The work of framing and assembling timbers for the hull was begun July 5, 1906, and the hull launched August 20, 1906. The boat was far enough completed for a trial to be made November 16 to 20, much delay having been experienced on account of the main engine furnished by the contractor for that machine not being large enough and rendering the substitution of new cylinders necessary. The new centrifugal pump and electric-light plant for this boat have been ordered and are expected to be installed at an early date. The total cost to date, including the pump and electric-light plant, is \$15,250.47.

*New machinery for dredge Wabash.*—This work included the removal of old machinery and the installation of one 60-horsepower boiler; one double cylinder, 8½ by 12 inch, double-drum hoisting engine; one 6½ by 8 inch double cylinder, reversible-link motion, single drum, swinging engine; one 5 by 7 inch double-cylinder steam capstan; covering boiler; and an electric-light outfit, which has been ordered but not yet installed. The cost, including the latter, is \$3,923.42.

*Completing south canal wall.*—The exceedingly unfavorable conditions, caused by repeated rain and rises in the river, greatly retarded the progress of the work. However, the main wall and a portion of the slope paving has been completed. Following is a summary of work accomplished to June 30, 1907:

Earth removed from ledge.....	cubic yards..	12, 882. 47
Rock disrupted.....	do.....	5, 591. 1
Masonry:		
Cut stone .....	do.....	1, 324. 21
Backing .....	do.....	2, 332. 73
Concrete .....	do.....	66. 95
Rubble foundation .....	do.....	18. 39
Disrupted rock placed north of north canal wall.....	do.....	309
Face stone cut for use in new wall.....	do.....	7. 8
Curbing drilled and placed around slope paving.....	linear feet.....	235
Curbing drilled and stored for use as needed.....	do.....	200
Rough stone dressed.....	cubic yards.....	22
Mud and rock removed from in front of wall.....	do.....	11, 361. 2
Mud removed from wall and surroundings.....	do.....	2, 480. 5
Old wall and guard gate masonry removed.....	do.....	906. 44
Paving placed on slope.....	square yards.....	687. 5
Concrete coping placed.....	cubic yards.....	90. 01
Earth excavated from south slope.....	do.....	914. 9

Total expenditures to June 30, 1907, \$41,764.92. Digitized by Google

*Miscellaneous, supplies and contingencies.*—Expenditures under this heading were for necessary supplies for use in shops, on dredges and towboats, and for fuel for boats, locks, shops, etc., and amounted to \$11,500.30.

*Dry dock.*—During the year the dry dock was used by private boats eleven days and one hour, for which \$135.42 was collected and deposited to the credit of the Treasurer of the United States. It was used for docking 25 Government boats one hundred and forty days and one hour.

*Summary of expenditures on account of operating and care of Louisville and Portland Canal, fiscal year 1907, showing general items and amount expended under each heading.*

Item.	Amount.
Services.....	\$91,215.69
Supplies.....	8,568.78
Materials.....	28,028.08
Miscellaneous.....	520.68
Total.....	128,328.13

#### Collections.

1906.	
July 2. Byrne and Speed Coal Company, for use of dredging plant.....	\$140.63
Aug. 21. Ohio River Sand Company, for use of dry dock.....	17.50
Sept. 18. Speed Elevator Company, for rent of land.....	125.00
Oct. 20. H. W. Avery, for use of dry dock.....	15.00
Oct. 23. Louisville and Evansville Packet Company, for use of dry dock.....	60.42
Dec. 13. O'Donnell & Co., for rent of land.....	50.00
1907.	
Jan. 12. Union Cement and Lime Company, for rent of land.....	5.00
Jan. 16. Louisville Cement Company, for rent of land.....	30.00
Mar. 25. Speed Elevator Company, for rent of land.....	125.00
May 1. Louisville Boat Club, for use of dry dock.....	42.50
May 25. Byrne and Speed Coal Company, for use of dredging plant.....	330.00
Total .....	941.05

All of the above collections were deposited to the credit of the Treasurer of the United States.

#### APPROPRIATIONS AND ALLOTMENTS.

##### APPROPRIATIONS.

Act of March 3, 1881 ..... \$40,562.91

##### ALLOTMENTS.

[From act of March 3, 1881.]

Fiscal year 1882.....	\$54,105.66	Fiscal year 1884.....	\$53,189.18
Fiscal year 1883.....	61,333.14	Fiscal year 1885.....	4,872.02



[From act of July 5, 1884.]

_____, 1884.....	\$67,496.56	July 23, 1897.....	\$67,311.47
August 3, 1885.....	91,840.00	July 15, 1898.....	62,061.71
July 28, 1886.....	82,320.00	July 19, 1899.....	78,422.89
July 2, 1887.....	77,805.00	July 18, 1900.....	78,590.05
July 13, 1888.....	99,456.79	July 17, 1901.....	108,550.20
July 20, 1889.....	93,744.00	July 30, 1902.....	118,732.34
July 19, 1890.....	55,548.88	July 24, 1903.....	43,484.66
July 17, 1891.....	78,769.38	July 15, 1904.....	92,385.46
July 20, 1892.....	102,175.94	July 20, 1905.....	76,748.41
July 13, 1893.....	77,158.68	September 9, 1905.....	25,000.00
September 9, 1893.....	2,000.00	March 10, 1906.....	10,200.00
July 11, 1894.....	114,528.08	July 13, 1906.....	108,567.53
November 27, 1894.....	1,500.00		
July 11, 1895.....	112,838.28		
July 28, 1896.....	123,715.05	Total.....	2,285,034.27

## COMMERCIAL STATISTICS.

*Statement of traffic through the Louisville and Portland Canal July 1, 1906, to June 30, 1907.*

Kind of craft.	Number.	Tonnage.
Passenger boats.....	415	157,018
Towboats.....	880	110,068
Government boats.....	232	29,014
Coal barges.....	2,667	874,226
Other barges.....	579	126,489
Small craft.....	364	951
Rafts.....	5	0
Total.....	5,342	1,297,756

Total number of lockages during the past fiscal year, 2,212.

*Statement of traffic through the open river channel over the Falls of the Ohio River at Louisville, Ky., from July 1, 1906, to June 30, 1907.*

Kind of craft.	Number.	Tonnage.
Passenger boats.....	148	57,489
Towboats.....	452	61,060
Government boats.....	20	1,706
Coal barges.....	789	267,821
Other barges.....	126	31,502
Small craft.....	9	64
Rafts.....	1	0
Total.....	1,545	419,642

# 1804 REPORT OF THE CHIEF OF ENGINEERS, U. S. ARMY.

*Statement of commerce through the Louisville and Portland Canal from July 1, 1906, to June 30, 1907.*

Article.	Tons.	Article.	Tons.
Coal .....	953, 187	Straw .....	2, 123
Corn .....	1, 529½	Cattle .....	1, 662
Wheat .....	5, 767½	Swine and sheep .....	2, 514
Salt .....	7, 546	Horses and mules .....	218½
Oil .....	620	Lumber, B. M. ....	14, 845½
Whisky .....	2, 053½	Staves .....	4, 190
Flour .....	229½	Shingles .....	154½
Sugar .....	272½	Steel rails .....	2
Molasses .....	2, 015½	Manufactured iron .....	21, 167
Cement .....	547	Produce .....	2, 718½
Tobacco .....	3, 876	General and miscellaneous .....	49, 705
Cotton .....	1, 581½		
Hay .....	1, 261½	Total .....	1, 079, 534½

Number of passengers, 12,496.

*Statement of commerce through the open river channel over the Falls of Ohio River, at Louisville, Ky., from July 1, 1906, to June 30, 1907.*

Article.	Tons.	Article.	Tons.
Coal .....	401, 474	Straw .....	177½
Corn .....	101½	Cattle .....	619½
Wheat .....	45½	Swine and sheep .....	601½
Salt .....	388	Horses and mules .....	104½
Oil .....	381½	Lumber, B. M. ....	5, 010½
Whisky .....	417	Staves .....	557
Flour .....	101½	Steel rails .....	0
Sugar .....	149½	Manufactured iron .....	9, 497½
Molasses .....	1, 502½	Brick .....	765
Cement .....	91½	Produce .....	5
Tobacco .....	381	General and miscellaneous .....	30, 400½
Cotton .....	449½		
Hay .....	557	Total .....	453, 792

Number of passengers, 4,001.

*Comparative statement of traffic and commerce at Louisville, Ky.*

## TRAFFIC.

Fiscal year.	Via Louisville and Portland Canal.					Via open river.					Aggregate.
	Pas-senger boats.	Tow-boats.	Coal boats and barges.	Mis-cella-neous.	Total.	Pas-senger boats.	Tow-boats.	Coal boats and barges.	Mis-cella-neous.	Total.	
1895.....	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.
1896.....	637	513	2, 121	353	3, 624	101	227	577	3	908	4, 532
1897.....	635	771	2, 975	184	4, 565	128	274	641	2	1, 045	5, 610
1898.....	649	746	2, 483	279	4, 157	310	323	1, 374	33	2, 540	6, 697
1899.....	595	883	2, 847	265	4, 590	176	435	838	67	1, 515	6, 105
1900.....	584	859	2, 783	354	4, 580	230	659	1, 432	148	2, 469	7, 049
1901.....	681	988	3, 276	328	5, 273	94	204	356	85	739	6, 012
1902.....	611	949	3, 255	213	5, 028	175	619	1610	188	2, 592	7, 620
1903.....	627	770	2, 387	480	4, 214	134	470	971	124	1, 699	5, 913
1904.....	503	870	3, 054	285	4, 712	202	788	1, 539	64	2, 598	7, 305
1905.....	518	900	3, 456	645	5, 519	89	481	926	21	1, 517	7, 036
1906.....	410	894	2, 673	750	4, 727	88	377	804	213	1, 482	6, 209
1907.....	501	1, 055	3, 599	666	5, 821	82	269	597	121	1, 069	6, 890
	415	880	3, 446	601	5, 342	148	452	915	30	1, 545	6, 887

*Comparative statement of traffic and commerce at Louisville, Ky.—Continued.*

## COMMERCE.

Fiscal year.	Via Louisville and Portland Canal.			Via open river.			Aggregate.
	Coal.	Other freight.	Total.	Coal.	Other freight.	Total.	
	<i>Tons.</i>	<i>Tons.</i>	<i>Tons.</i>	<i>Tons.</i>	<i>Tons.</i>	<i>Tons.</i>	<i>Tons.</i>
1896.....	564,281	162,776	727,057	388,015	20,572	402,587	1,129,644
1896.....	989,957	285,766	1,275,723	390,260	35,954	426,214	1,701,987
1897.....	807,441	264,873	1,072,314	730,571	84,549	815,120	1,887,434
1898.....	859,411	289,353	1,148,764	516,728	53,226	569,954	1,718,718
1899.....	735,479	251,653	987,132	765,758	95,155	860,923	1,848,055
1900.....	1,008,524	273,274	1,281,798	274,215	18,181	292,396	1,574,194
1901.....	863,047	264,540	1,127,587	904,239	94,949	999,188	2,126,775
1902.....	496,278	351,344	847,622	530,555	95,424	625,979	1,473,601
1903.....	764,366	230,026	994,392	989,856	108,269	1,048,125	2,082,457
1904.....	1,413,063	144,328	1,557,391	498,868	43,119	541,927	2,099,318
1905.....	594,169	138,438	732,607	479,434	30,209	509,643	1,242,250
1906.....	867,514	186,012	1,053,526	352,005	31,143	383,148	1,436,674
1907.....	968,187	126,347	1,079,534	401,474	52,318	453,792	1,583,326

## I I 3.

## IMPROVEMENT OF WABASH RIVER, INDIANA AND ILLINOIS.

Description of original condition, projects, object, and scope of improvement, etc., relating to the two divisions of the river will be found in Annual Reports of the Chief of Engineers for fiscal years as follows: 1886, page 2239; 1898, page 1870; 1902, page 1984.

## BELOW VINCENNES.

The amount carried in the money statement as required for completion of the existing project is the original estimate for closing the cut-off at New Harmony, Ind. Since that estimate was made in 1898 the channel to be closed has increased both in width and depth, and the cost of labor and materials has increased very greatly. Therefore, that estimate will not be sufficient to do the work and should be increased to at least \$75,000, which it is thought will be required to accomplish the work at the present time. This amount should be appropriated at one time, as it will not be advisable to begin the work until the amount sufficient for completion is available. Should that amount be appropriated, there should also be made an annual appropriation for keeping the river clear of snags—\$15,000 for the first year and \$10,000 for each year thereafter. It is believed that closing the cut-off and keeping the channel clear of snags will make possible light-draft navigation from the mouth to Vincennes for practically the entire year. At present there is no through navigation during the greater part of the year.

*Money statement.*

July 1, 1906, balance unexpended	\$42. 80
July 1, 1907, balance unexpended	42. 80
July 1, 1907, outstanding liabilities	25. 75
July 1, 1907, balance available	17. 05
Amount (estimated) required for completion of existing project	75, 000. 00
Amount that can be profitably expended in fiscal year ending June 30, 1909, in addition to the balance unexpended July 1, 1907:	
For works of improvement	\$50, 000. 00
For maintenance of improvement	10, 000. 00
	60, 000. 00
Submitted in compliance with requirements of sundry civil act of June 4, 1897, and of section 7 of the river and harbor act of 1899.	

## APPROPRIATIONS.

June 10, 1872	\$50, 000	August 5, 1886	\$60, 000
March 3, 1873	50, 000	August 11, 1888	60, 000
June 23, 1874	25, 000	September 19, 1890	60, 000
March 3, 1875	40, 000	July 13, 1892	60, 000
August 14, 1876	70, 000	August 18, 1894	15, 000
June 18, 1878	50, 000	June 3, 1896	15, 000
March 3, 1879	20, 000	March 3, 1899	15, 000
June 14, 1880	25, 000	June 13, 1902	5, 000
March 3, 1881	25, 000		
August 2, 1882	40, 000	Total	715, 000
July 5, 1884	30, 000		

## ABOVE VINCENNES.

No work was in progress on this section of the river during the year, the balance available being too small to permit of any advantageous operations.

*Money statement.*

July 1, 1906, balance unexpended	\$261. 58
June 30, 1907, amount expended during fiscal year, for maintenance of improvement	16. 45
July 1, 1907, balance unexpended	245. 13

## APPROPRIATIONS.

March 3, 1881	\$25, 000	August 18, 1894	\$5, 000
August 2, 1882	30, 000	June 3, 1896	6, 000
July 5, 1884	10, 000	March 3, 1899	4, 000
August 11, 1888	5, 000		
September 19, 1890	5, 500	Total	95, 500
July 13, 1892	5, 000		

## COMMERCIAL STATISTICS.

The only commercial statistics available for the year are given in the following report for "Operating and Care of the Lock and Dam at Grand Rapids."

## I I 4.

## OPERATING AND CARE OF LOCK AND DAM AT GRAND RAPIDS, WABASH RIVER.

The project and estimate for the operation and care of this lock and its appurtenant structures during the fiscal year ending June 30, 1907, contained the following items:

Regular force-----	\$1,200
Repairs, etc-----	1,400
Miscellaneous-----	700
Total-----	3,300

The item for repairs provided for the completion of the abutment crib, which was commenced the previous year, the construction of a new flatboat, two new skiffs, and ordinary repairs.

Expenditures during the year were for the payment of the lock tender, completion of extension of abutment crib, the total cost of which was \$1,511.21; 1 flatboat, cost \$145.65; 2 skiffs, cost \$48; repairs to sheeting of dam, construction of new fences around the cottage and Government land on abutment side of the river, repairs to walks, whitewashing outbuildings, and other minor work.

*Summary of expenditures on account of operating and care of lock and dam at Grand Rapids, Wabash River, during the fiscal year 1907, showing general items and amounts expended under each heading.*

Item.	Amount.
Services .....	\$1,247.43
Supplies .....	11.60
Materials .....	1,252.98
Miscellaneous .....	109.25
Total .....	2,621.11

## ALLOTMENTS.

March 12, 1897-----	\$240.00	July 20, 1903-----	\$328.89
July 23, 1897-----	1,703.25	July 15, 1904-----	2,711.06
July 15, 1898-----	1,451.35	July 17, 1905-----	172.14
July 21, 1899-----	9,346.16	July 16, 1906-----	2,692.25
July 17, 1900-----	7,752.52		
July 10, 1901-----	5,184.34	Total-----	32,891.34
July 29, 1902-----	1,311.38		

# 1808 REPORT OF THE CHIEF OF ENGINEERS, U. S. ARMY.

## COMMERCIAL STATISTICS.

*Statement of traffic and commerce passing the lock at Grand Rapids, Wabash River, for the fiscal year ending June 30, 1907.*

### TRAFFIC.

Kind of boat.	Number.	Tonnage.
Passenger.....	275	1,291
Tow.....	299	5,700
Government.....	2	50
Barges.....	197	16,550
Small craft.....	1,086	2,647
Rafts.....	28	
Total.....	1,886	26,247

Total number of lockages during the year is 964.

### COMMERCE.

Article.	Quantity.
	Tons.
Coal.....	42
Corn.....	427
Wheat.....	159
Shells.....	1,114
Lumber.....	863
Timber.....	3,283
Miscellaneous.....	716
Total.....	6,600

Passengers, 706.

*Comparative statement of traffic and commerce at lock at Grand Rapids, Wabash River.*

Fiscal year.	Traffic.					Com- merce.
	Steam- boats.	Barges and flats.	Rafts.	Miscella- neous.	Total.	
	No.	No.	No.	No.	No.	Tons.
1897.....	60	80	27	130	297	3,749
1898.....	46	76	31	199	352	2,374
1899.....	45	53	32	118	248	2,417
1900.....	49	53	36	100	238	6,419
1901.....	62	68	25	112	267	2,364
1902.....	48	45	14	171	278	2,448
1903.....	91	82	10	114	297	2,747
1904.....	189	53	38	249	479	4,370
1905.....	220	90	45	1,042	1,397	8,026
1906.....	514	265	18	1,346	2,138	3,990
1907.....	576	197	28	1,086	1,886	6,600

I I 5.

## IMPROVEMENT OF WHITE RIVER, INDIANA.

No operations under the existing project for the improvement of this river were in progress during the past fiscal year, the funds under the approved estimate being almost exhausted.

Full report of project, original condition, scope of improvement, etc., will be found in Annual Report of the Chief of Engineers for the fiscal year 1896, page 2244.

*Money statement.*

July 1, 1906, balance unexpended.....	\$703. 82
July 1, 1907, balance unexpended.....	703. 82

APPROPRIATIONS.

March 3, 1879.....	\$25, 000	August 11, 1888.....	\$5, 000
June 4, 1880.....	20, 000	July 13, 1892.....	5, 000
March 3, 1881.....	20, 000	August 18, 1898.....	5, 000
August 2, 1882.....	20, 000	June 3, 1896.....	2, 500
July 5, 1884.....	10, 000		
August 5, 1886.....	7, 500	Total.....	120, 000

I I 6.

IMPROVEMENT OF GREEN RIVER ABOVE THE MOUTH OF BIG  
BARREN RIVER, KENTUCKY.

The river and harbor act of June 13, 1902, provided funds for the construction of the second lock (No. 6, Green River) proposed in the approved project of August 11, 1891, for the extension of slack-water navigation on this part of the Green River to Mammoth Cave, Ky., and this lock, although not quite completed, was opened to traffic on January 1, 1906.

At the end of the last fiscal year the lock and its appurtenant structures were completed except for the work stated below to have been done during the present fiscal year. This consisted in the completion of the wing of the lower shore guide wall; the driving of guide piles above the upper river guide wall and the completion of the grillage between the sections of that wall; the construction of the second lock-tender's cottage, the total cost of which was \$3,449.81, and the grading and riprapping of 1,438 square yards of bank below abutment and dam, as well as some minor work. The backing above the dam has not been completed, but it is intended to make this fill by the dumping of dredged material in connection with regular dredging operations.

The appropriation has now been exhausted except for \$485.43, which is retained to pay for land to be used for a roadway to connect the United States land on the abutment side with the nearest public road. In connection with the purchase of this land, I wish to call especial attention to the great delay in the examination of land titles. In this case the abstract of records was submitted to the United States district attorney for this district in October, 1906, for examination, pursuant to authority of the War Department, March 26, 1906. But progress in the matter has been so slow that nothing further than a preliminary report, dated June 25, 1907, has been received, and it is

not known whether a satisfactory title can be obtained in the ordinary way, or whether condemnation proceedings will be necessary to clear the title, which proceedings, of course, will involve additional long delay. Another case in point was the acquisition of the site for the construction of this lock, which was provided for by the act of June 13, 1902, but actual work on which was not begun before June 14, 1904, the delay being due to the fact that the purchase was not completed until January 16, 1904. This land was obtained by condemnation, the regular operations of which consume much time, but the papers in the case were completed and sent to the United States Attorney-General about the end of August, 1903, and were not received back until January, 1904. The slowness with which such papers are acted on is undoubtedly due to the press of the many other duties of the officers of the Department of Justice, for which I see no remedy unless it be possible to get that Department to appoint a special agent or agents whose sole duty shall be the examination of land titles for the Engineer Department.

*Money statement.*

July 1, 1906, balance unexpended.....	\$9,037.74
June 30, 1907, amount expended during fiscal year, for works of improvement.....	8,457.57
July 1, 1907, balance unexpended.....	580.17
July 1, 1907, outstanding liabilities.....	94.74
July 1, 1907, balance available.....	485.43

APPROPRIATIONS.

July 13, 1892.....	\$50,000.00	June 13, 1902.....	\$180,000.00
August 18, 1894.....	25,000.00	March 3, 1905.....	5,000.00
June 3, 1896.....	20,000.00		
March 3, 1899.....	85,673.20	Total.....	365,673.20

COMMERCIAL STATISTICS.

Commercial statistics are given in the following report for "Operating and care of locks and dams on Green and Barren rivers, Kentucky."

I I 7.

OPERATING AND CARE OF LOCKS AND DAMS ON GREEN AND BARREN RIVERS, KENTUCKY.

The project and estimate for the fiscal year ending June 30, 1907, approved July 16, 1906, provided as follows:

It is proposed to operate the several locks and to make such repairs to them, the dams, guide cribs, dwellings, storehouses, and other Government property at the several locks, as are necessary to maintain the system in good navigable



condition and keep the other Government property in repair, in connection with which work the snagging and dredging outfits will be operated to keep the pools, lock chambers, and entrances thereto free from deposits of mud, leaves, snags, and other obstructions brought into them by the varying stages of water. The system now comprises seven locks and dams, viz, Nos. 1, 2, 3, 4, 5, and 6, Green River, and No. 1, Barren River, together with the contiguous land and buildings owned by the United States.

The estimate for the fiscal year 1907 is summarized as follows:

Regular force .....	\$36,084.96
Repairs .....	38,905.62
Miscellaneous, supplies, and contingencies .....	5,000.00
Total .....	79,990.58

On account of the exceedingly unfavorable working season of 1906, due to heavy rains and frequent rises in the river, a large portion of the repair work provided for in the foregoing estimate could not be completed during the fiscal year, and that which was done cost very much more than it would have cost if done during a working season of average conditions.

Under the project and the estimate mentioned above the operations during the fiscal year, in addition to the ordinary work of passing traffic through the locks and minor repairs incident to care and preservation, were as follows:

At Lock No. 1, Green River, mud, drift, snow, etc., were repeatedly cleaned from the lock walls, gates, cribs, and paving. The lock gates, flagstaff, gages, and snubbing posts were painted, outbuildings and fences whitewashed, and weeds cut from the grounds.

At Lock No. 2, Green River, the work of reconstructing upper and lower shore cribs, in progress at close of June, 1906, was completed—the upper crib August 20, 1906, and the lower crib October 25, 1906. The foundation of this upper crib consists of the old timber crib upon which was placed a concrete base 8 feet wide and 3 feet high, and upon this the concrete superstructure, 244 feet long, built to a height level with the top of the lock wall; this superstructure has a base width of 7 feet, the rear face is battered so as to give a top width of 4 feet, and the crib is supplied with five snubbing posts and two ladders.

Material .....	\$1,305.28
Labor .....	1,793.76
Total .....	3,099.04

The foundation for the lower shore crib is solid rock at a depth of about 3 feet below lower pool level. A concrete base 12 feet wide and 4 feet 8 inches high was first constructed, and on this was built the superstructure, 176 feet 8 inches long, to a height level with the lock wall. The superstructure has a base width of 11 feet; the rear face is battered so as to give a top width of 5 feet and is supplied with five snubbing posts on top and twelve mooring hooks and three ladders on the front face. A hand railing runs the entire length of the top.

Material .....	\$4,364.08
Labor .....	3,287.30
Total .....	7,651.38

A concrete walk, 78 feet long and 3 feet wide, was constructed at the lockmaster's cottage, roofs of cottage and warehouse painted;

the lock gates were also painted, mud, leaves, and drift repeatedly removed from the lock walls, cribs, etc., and fences and outbuildings whitewashed.

At Lock No. 3, Green River, no work was in progress other than that necessary to remove the mud, drift, etc., deposited by the repeated rises in the river, and paint the lock gates, gauges, and flagstaff, white-wash the fences and outbuildings, and repaper the walls and ceilings of the cottages.

At Lock No. 4, Green River, the old timber crib abutment was removed and replaced with a concrete structure resting on a pile foundation. The work was begun August 1, 1906, but on account of the frequent rises in the river was not completed until December 3, 1906. The abutment is supported by 97 round beech piles 25 feet long, penetrating, on an average, 22 feet below lower pool level; the heads of the piles extend into the concrete base about 2 feet. The base is 95 feet long, 16 feet wide for a distance of 57 feet from the upper face, 12 feet wide the remaining 38 feet, and 8 feet high, and has a wing wall 19 feet long, 16 feet wide, and 8 feet high. The concrete superstructure, 11 feet 6 inches wide at base, extends to a height one-half inch above that of the lock walls, and is battered on the rear side so as to give a top width of 7 feet.

Expended:

Material.....	\$5,091.41
Labor.....	7,430.57
Barge hire.....	1,512.00
Total.....	14,033.98

The work preparatory to reconstructing the rotted section of the old timber upper river crib with concrete was begun May 1, 1907, suspended May 6, resumed June 21, and again suspended June 24. Both suspensions were on account of high water. Expenditures to date are as follows:

Material.....	\$1,005.82
Labor.....	90.00
Total.....	1,095.82

A 62-foot section of the old lower timber crib has been removed as far as the present stage of water permits. The material for its reconstruction with concrete is now on hand.

Expended:

Labor.....	\$704.52
Material.....	1,452.59
Total.....	2,157.11

The tools and appliances stored at this lock have been cared for, repaired when necessary, and issued for service when needed; mud and drift removed from the lock walls, gates, etc., lock gates, gauges, and flagstaff painted, and fences and outbuildings whitewashed.

At Lock No. 5, Green River, the work in progress June 30, 1906, on the roadway was completed August 14, 1906. Minor repairs to the lower crib were made and the work of placing a new roof on one of the cottages nearly completed. The old heel casting and the pintle of the river leaf of the lower gate of the lock were found to be broken and were replaced with new ones. On April 20, 1907, a second sink-

hole appeared above the upper wing wall of the lock. It was immediately filled, and heavy sheeting placed along the face of the upper land crib and well back in the shore to prevent scour by the water, which was observed to be drawing through the crib. During the present season it is proposed to remove the old wood floor of the lock and replace it with one of concrete and make such other repairs as will prevent a recurrence of the sinks and leakage. Fences and outbuildings were whitewashed, lock gates and gauges painted, and minor current repairs made as needed.

At Lock No. 6, Green River, 1,146 square yards of the slope below the lock were graded and riprapped and 434 cubic yards large stone placed below the dam and along the bank on the abutment side of the river. An area of about 5,000 square yards between the cottages was graded and set in Bermuda grass; a cistern, 12 feet in diameter, 13 feet deep, built; porch steps and drains constructed, flagstaff erected, fences whitewashed, and lock gates painted.

At Lock No. 1, Barren River, there was driven a row of round hickory guide piles extending from the upper face of the upper river crib 40 feet up stream. The piles are fastened together with 6 by 10 inch waling. At the upper end of the row a cluster of 3 piles was driven to serve as a bumper for craft entering the approach.

Expended:

Labor.....	\$163. 00
Material.....	82. 50
Total.....	245. 50

On June 26, 1907, a cofferdam was placed above the upper gates of the lock, the mud deposit removed from the upper breast wall, and such repairs made as were necessary to stop leakage through the wall; the gates were also raised and adjusted.

Expended:

Labor.....	\$60. 60
Material.....	47. 43
Total.....	108. 03

The site for the lower river crib has been dredged, scraped, etc., preparatory to placing the timber foundation. All necessary material for the construction of this crib with a concrete superstructure is on hand. The expenditures to June 30, 1906, amount to \$1,114.68.

The locks gates were painted, fences and outbuildings whitewashed, mud, drift, etc., removed from the lock walls, cribs, etc., and grass and weeds cut from the grounds.

*Snag boat Wm. Preston Dixon.*—This boat was in commission the entire year, and, together with her crew, was engaged in the general work of snagging in the several pools, towing material for the repair work, and assisting in that work. Following is a summary of work done.

As snag boat:

Snags removed in Pool No. 1, Green River.....	9
Snags removed in Pool No. 2, Green River.....	14
Snags removed in Pool No. 3, Green River.....	20
Snags removed in Pool No. 4, Green and Barren rivers.....	86
Snags removed in Pool No. 5, Green River.....	7
Snags removed in Pool No. 6, Green River.....	11

## As snag boat—Continued.

Trees deadened in Pool No. 4, Green and Barren rivers.....	12
Trees removed in Pool No. 4, Green and Barren rivers.....	21
Sunken barges removed in Pool No. 1, Barren River.....	1
Snags removed in Pool No. 1, Barren River.....	11
Trees deadened in Pool No. 1, Barren River.....	6
Miles run as snagboat.....	892

## As towboat:

Derrick boats towed.....	58
Barges towed.....	188
Dredges towed.....	5
Scows towed.....	12
Quarterboats towed.....	4
Miles run as towboat.....	5, 277

## Miscellaneous:

Inspection trips made.....	9
Miles run in miscellaneous work.....	1, 188

The furnace of this boat was overhauled, new walls and liners put in, minor repairs made to boilers, machinery, decks, roofs, baths, and the boat cleaned and painted.

## Expenditures:

Material.....	\$363. 90
Labor.....	60. 30

Total.....	424. 20
------------	---------

*Towboat Emerald.*—This boat was in commission the entire year and was engaged in miscellaneous towing in connection with the repair work at Locks Nos. 2, 4, and 6, Green River; snagging operations in Rough River; inspection work and acting as dredge tender, as follows:

## As towboat:

Derrick boats towed.....	40
Barges towed.....	188
Dredges towed.....	6
Scows towed.....	7
Miles run as towboat.....	4, 803

## As dredge tender:

Scows towed.....	116
Material towed..... cubic yards.....	9, 455
Miles run as dredge tender.....	64

## Miscellaneous:

Trips made.....	13
Miles run.....	271

This boat's roof was repaired and painted, new fenders put on, new liners put in furnace, new flues put in boiler, cylinders bored, and minor repairs made to machinery.

*Dredge No. 1, Green River.*—This boat was engaged in dredging operations from July 1, 1906, to January 15, 1907, and from April 20, 1907, to the close of the fiscal year. A synopsis of work done follows:

## Lock No. 2, Green River:

Mud and leaves from upper approach..... cubic yards.....	4, 460
Mud and leaves from lower approach..... do.....	3, 810

## Lock No. 4, Green River:

Material from bar below lock..... do.....	462
Material from coffer above abutment..... do.....	850
Timber from coffer above abutment..... linear feet.....	1, 030
Log from lock chamber.....	1

Lock No. 5, Green River, material from bar below rock..... cubic yards.....	150
---	-----

Lock No. 6, Green River, stumps from upper approach.....	2
--	---

## Pool No. 6, Green River, near Mammoth Cave Landing:

Material .....	cubic yards..	18, 770
Stumps .....		5
Logs .....		45
At mouth of Echo River, material .....	cubic yards..	580
At Big Spring bar, material .....	do.....	6, 280
At Sanders's ford, material .....	do.....	240
At Houchlin's ford, material .....	do.....	4, 960
At Davis's fish trap, material .....	do.....	4, 970
At Davis's fish trap, logs .....		33
At Board Cut Island, material .....	cubic yards..	980
Between Mammoth Cave and Lock No. 6, snags .....		47
Lock No. 1, Barren River:		
Timber, stone, and mud from lower approach .....	cubic yards..	1, 130
Mud from upper approach .....	do.....	600

About 4,000 cubic yards of the sand and gravel dredged in pool No. 6 were loaded onto barges and transferred to Locks 2 and 4, Green River, for use in the concrete works at those locks. The crew also assisted in the repair work at Locks 2 and 4, Green River. The boat's machinery was overhauled, new sheaves, chains, frictions, and spud put in, decks patched, and new roof put on and painted.

*Miscellaneous.*—The derrick boats and other floating plant received such repairs as were necessary to keep it in serviceable condition.

*Summary of expenditures on account of "Operating and care of Green and Barren rivers, Kentucky," fiscal year 1907, showing items and amount expended under each heading.*

Items.	Amount.
Services .....	\$51, 109. 80
Supplies .....	6, 648. 54
Materials .....	20, 945. 80
Miscellaneous .....	523. 88
Total .....	79, 228. 02

*Collections.*

1906.	
July 7. Jett & Turner, for water power at Lock No. 2, Green River .....	\$50. 00
July 30. William Boulton, for water power at Lock No. 1, Barren River .....	55. 48
1907.	
Jan. 7. Jett & Turner, for water power at Lock No. 2, Green River .....	50. 00
Jan. 12. R. C. Bryant, for water power at Lock No. 2, Green River .....	150. 00
Jan. 12. Craig Brothers, for water power at Lock No. 3, Green River .....	75. 00
Total .....	360. 48

All of these collections were deposited to the credit of the Treasurer of the United States.

## APPROPRIATIONS AND ALLOTMENTS.

August 11, 1888 .....	\$135, 000. 00	July 15, 1898 .....	\$70, 219. 76
January 4, 1889 .....	167, 112. 00	July 22, 1899 .....	65, 007. 65
July 20, 1889 .....	139, 110. 00	July 17, 1900 .....	69, 349. 64
July 17, 1890 .....	53, 783. 47	July 10, 1901 .....	43, 236. 82
July 16, 1891 .....	77, 807. 26	July 30, 1902 .....	105, 629. 33
July 15, 1892 .....	46, 264. 26	July 20, 1903 .....	34, 720. 47
July 15, 1893 .....	49, 730. 88	July 25, 1904 .....	23, 610. 25
July 13, 1894 .....	25, 927. 23	July 17, 1905 .....	48, 517. 10
January 26, 1895 .....	6, 000. 00	July 16, 1906 .....	73, 129. 48
July 20, 1896 .....	51, 080. 31		
September 2, 1896 .....	77, 684. 35		
July 23, 1897 .....	57, 459. 61	Total .....	1, 420, 379. 86

# 1816 REPORT OF THE CHIEF OF ENGINEERS, U. S. ARMY.

## COMMERCIAL STATISTICS.

*Statement of traffic passing the locks on Green and Barren rivers from July 1, 1906, to June 30, 1907.*

Kind of boat.	Green River.							
	Lock No. 1.		Lock No. 2.		Lock No. 3.		Lock No. 4.	
	Number.	Tonnage.	Number.	Tonnage.	Number.	Tonnage.	Number.	Tonnage.
Passenger.....	495	54,784	541	57,349	1,004	57,408	475	57,018
Tow.....	1,034	80,674	582	29,447	305	18,680	548	29,406
Government.....	2	400	98	10,271	57	8,514	201	29,242
Barges.....	2,525	614,785	987	392,867	778	842,577	891	323,223
Small craft.....	542	5,409	297	2,359	208	709	212	1,976
Rafts.....	809		288		114		111	
Total.....	4,907	785,962	2,788	492,298	2,466	427,886	2,436	440,855
Lockages, fiscal year.	8,601		2,370		2,619		2,362	

Kind of boat.	Green River.				Barren River.	
	Lock No. 5.		Lock No. 6.		Lock No. 1.	
	Number.	Tonnage.	Number.	Tonnage.	Number.	Tonnage.
Passenger.....	181	14,451	156	12,719	555	59,523
Tow.....	347	19,984	183	10,281	369	18,468
Government.....	162	23,945	107	8,487	74	12,044
Barges.....	570	180,580	334	153,571	445	126,301
Small craft.....	119	1,131	478	481	78	520
Rafts.....	57		47		9	
Total.....	1,486	240,101	1,300	185,539	1,530	216,856
Lockages, fiscal year.	1,490		1,460		1,461	

*Statement of commerce passing the locks on Green and Barren rivers from July 1, 1906, to June 30, 1907.*

Articles.	Green River.						Barren River.
	Lock No. 1.	Lock No. 2.	Lock No. 3.	Lock No. 4.	Lock No. 5.	Lock No. 6.	Lock No. 1.
	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.
Coal.....	51,970	556	4,509	13,556	1,562	80	14,168
Corn.....	286	119	122	149	5	4	202
Wheat.....	499	390	180	45		183	57
Salt.....	1,087	570	582	277	133		254
Oil.....	860	355	294	113	806	11	379
Whisky.....	2	8	8	6			
Flour.....	1,120	891	528	414	130	61	494
Sugar.....	1,081	891	284	840	35	11	319
Molasses.....	46	54	21	5	2		13
Cement.....	281	194	18	72	21	4	429
Tobacco.....	1,421	1,101	224	81			94
Hides.....	6	7	1	4			2
Hay.....	287	313	96	142	56	10	202
Straw.....	44	29	19	8		1	4
Cattle.....	1,864	1,000	467	166	8		45
Swine and sheep.....	1,845	1,091	649	226			82
Horses and mules.....	232	94	77	74	4	3	95
Lumber.....	10,898	8,312	667	192	91	16	471
Timber.....	158,237	122,641	89,815	38,124	32,363	23,644	2,805
Staves.....	12,457	14,517		18			7
Shingles.....	58	6	6		4		22
Ties, railroad.....	111,568	160,707	94,640	70,968	46,880	28,814	4,978
Hoop poles.....	136	141	159	15	40		40
Manufactured iron.....	105	96	22	32	71	2	62
Miscellaneous.....	21,148	17,084	12,175	10,364	7,563	5,777	12,247
Asphalt.....					5,880		5,765
Total.....	872,915	271,762	205,497	135,820	95,099	58,631	43,988
Passengers.....number..	13,270	8,226	11,086	7,484	1,490	1,460	1,461

*Comparative statement of traffic and commerce.*

## GREEN AND BARREN RIVERS, KENTUCKY.

Fiscal year.	Traffic.									
	Lock No. 1, Green River.					Lock No. 2, Green River.				
	Steam-boats.	Barges and flats.	Rafts.	Miscellaneous.	Total.	Steam-boats.	Barges and flats.	Rafts.	Miscellaneous.	Total.
	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.
1889.....	284	129	860	138	901	272	107	800	15	694
1890.....	864	886	1,079	111	2,480	776	286	768	12	1,842
1891.....	875	456	1,062	152	2,565	768	358	721	24	1,871
1892.....	787	449	898	184	2,318	634	272	786	6	1,697
1893.....	823	506	914	161	2,404	304	379	746	9	1,437
1894.....	832	437	602	176	2,047	477	338	418	9	1,232
1895.....	789	606	240	264	1,899	652	494	152	46	1,344
1896.....	1,143	563	620	162	2,478	702	469	440	168	1,779
1897.....	919	589	226	157	1,941	935	632	239	252	2,058
1898.....	1,122	882	340	200	2,544	1,087	847	260	182	2,326
1899.....	1,174	803	570	169	2,716	948	819	469	184	2,420
1900.....	1,088	1,239	481	132	2,940	946	1,067	521	156	2,710
1901.....	1,360	1,765	592	189	3,856	1,220	1,448	302	137	3,102
1902.....	992	1,113	630	137	2,772	820	927	364	255	2,866
1903.....	1,077	1,403	608	158	3,246	982	1,044	406	229	2,663
1904.....	1,378	2,127	338	185	4,028	1,106	1,384	227	207	2,923
1905.....	1,339	2,275	454	253	4,321	1,058	1,297	350	231	2,939
1906.....	1,449	1,729	262	377	3,817	1,095	1,063	322	236	2,686
1907.....	1,531	2,525	309	542	4,907	1,221	937	283	297	2,733

Fiscal year.	Traffic.									
	Lock No. 3, Green River.					Lock No. 4, Green River.				
	Steam-boats.	Barges and flats.	Rafts.	Miscellaneous.	Total.	Steam-boats.	Barges and flats.	Rafts.	Miscellaneous.	Total.
	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.
1889.....			200		200	115	49	41	51	256
1890.....						126	55	86	123	340
1891.....	225	57	372	101	756	399	141	87	184	761
1892.....	492	306	426	212	1,436	619	276	208	129	1,232
1893.....	509	289	560	249	1,587	553	333	292	144	1,332
1894.....	611	469	304	227	1,611	592	391	117	115	1,215
1895.....	711	456	123	212	1,502	866	471	54	116	1,507
1896.....	890	496	234	238	1,858	1,307	676	112	102	2,197
1897.....	867	522	108	144	1,638	1,249	820	53	53	2,176
1898.....	835	613	133	167	1,748	1,192	884	39	176	2,291
1899.....	712	532	315	220	1,779	1,073	828	159	141	2,201
1900.....	750	696	288	158	1,891	1,099	929	122	188	2,288
1901.....	1,019	1,081	202	108	2,410	1,347	1,017	75	141	2,580
1902.....	757	780	296	223	2,053	1,012	814	102	229	2,157
1903.....	717	707	278	233	1,935	1,049	763	111	249	2,173
1904.....	827	893	191	146	2,057	910	817	68	86	1,881
1905.....	775	910	301	171	2,157	1,115	917	84	108	2,219
1906.....	1,111	645	274	262	2,292	957	726	117	108	1,908
1907.....	1,366	773	114	203	2,456	1,224	891	111	212	2,438

# 1818 REPORT OF THE CHIEF OF ENGINEERS, U. S. ARMY.

## Comparative statement of traffic and commerce—Continued.

### GREEN AND BARREN RIVERS, KENTUCKY—continued.

Fiscal year.	Traffic.														
	Lock No. 5, Green River.					Lock No. 6, Green River.					Lock No. 1, Barren River.				
	Steamboats.	Barges and flats.	Rafts.	Miscellaneous.	Total.	Steamboats.	Barges and flats.	Rafts.	Miscellaneous.	Total.	Steamboats.	Barges and flats.	Rafts.	Miscellaneous.	Total.
	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.
1889.....											112	57	10	85	264
1890.....											23	20	8	13	64
1891.....											342	177	7	3	529
1892.....											565	180	36	30	801
1893.....											518	290	32	14	854
1894.....											584	347	22	42	945
1895.....											618	335	32	56	1,041
1896.....											859	351	15	36	1,261
1897.....											842	451	10	104	1,407
1898.....											789	553	1	86	1,329
1899.....											826	528	3	119	1,476
1900.....	289	255	47	76	616						797	462	4	103	1,365
1901.....	376	383	29	217	1,005						992	497	20	93	1,602
1902.....	391	398	58	182	1,014						869	499	10	108	1,476
1903.....	398	465	59	206	1,125						1,066	653	13	120	1,852
1904.....	520	646	49	307	1,422						819	486	5	53	1,363
1905.....	731	638	87	272	1,723						961	404	1	159	1,525
1906.....	774	480	73	104	1,431	290	167	52	123	632	1,212	462	8	71	1,733
1907.....	690	570	57	119	1,436	446	334	47	473	1,300	998	445	9	78	1,580

Fiscal year.	Commerce.						Barren River, Lock No. 1.
	Green River.						
	Lock No. 1.	Lock No. 2.	Lock No. 3.	Lock No. 4.	Lock No. 5.	Lock No. 6.	
	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.
1898.....	193,475	161,841	109,107	84,761			23,483
1899.....	257,104	184,896	94,189	48,973			43,504
1900.....	378,684	288,948	172,016	139,580	47,098		33,355
1901.....	452,522	286,744	188,512	117,054	57,058		46,445
1902.....	385,548	242,722	158,037	110,468	47,940		30,616
1903.....	467,886	259,142	165,746	106,119	59,525		48,782
1904.....	329,896	253,979	179,702	108,294	69,226		32,962
1905.....	466,015	308,274	257,181	157,208	107,548		38,486
1906.....	342,496	242,601	201,012	111,816	75,468	34,325	61,080
1907.....	372,915	271,762	205,497	136,320	95,099	58,621	43,998

List of boats plying on Green, Barren, and Rough rivers, Kentucky, during fiscal year ending June 30, 1907.

Name of boat.	Character.	Tonnage.
Wm. Preston Dixon.....	U. S. snagboat.....	200
Emerald.....	U. S. towboat.....	20
Evansville.....	Packet boat.....	144
Bowling Green.....	do.....	122
Chaparon.....	do.....	86
Nellie.....	do.....	13
We Three.....	do.....	12
Leona.....	do.....	9
Kalista.....	do.....	9
Water Lily.....	do.....	9
Little Clyde.....	Tow.....	98
Nellie Willet.....	do.....	98
Mary Lucy.....	do.....	98
J. M. Howell.....	do.....	94
Frances.....	do.....	98
D. A. Nisbet.....	do.....	85
Neptune.....	do.....	80
Mary Stewart.....	do.....	77



*List of boats plying on Green, Barren, and Rough rivers, Kentucky, etc.—Cont'd.*

Name of boat.	Character.	Tonnage.
Kenois .....	Tow .....	69
Thos. Parker .....	do .....	69
Isabella .....	do .....	65
Old Reliable .....	do .....	64
Penguin .....	do .....	60
Eclipse .....	do .....	57
Allie .....	do .....	58
Emma .....	do .....	58
Alfred Owen .....	do .....	52
Bernice .....	do .....	51
Samuel .....	do .....	48
R. Smith .....	do .....	44
Alma .....	do .....	42
Meter .....	do .....	39
Norway .....	do .....	24
Edna Russell .....	do .....	37
Messenger .....	do .....	15
James R. .....	do .....	12
Gertie M. .....	do .....	12
Cruiser .....	do .....	13
Brick .....	do .....	12
Shiloh .....	do .....	11
Island Queen .....	do .....	10
Lavalla D. .....	do .....	10
Maud .....	do .....	10
Eel .....	do .....	10
Katherine .....	do .....	10
Beaver .....	do .....	10
S. & Y. Sawyer .....	do .....	9
Augusta .....	do .....	9
Norton L. .....	do .....	9
Lena .....	do .....	9
R. O. K. .....	do .....	9
Duco .....	Towboat .....	8
Lydia Wheeler .....	do .....	8
Levi .....	do .....	8
Jessie .....	do .....	7
White Duck .....	do .....	7
R. Nash .....	do .....	6
Tillie .....	do .....	6
J. B. A. .....	Tugboat .....	51
Edgar .....	do .....	37
Ingleside .....	do .....	36
Clema .....	Pleasure boat .....	2
Lily .....	do .....	5
Little May .....	do .....	4
Stella .....	do .....	4
Raymond .....	do .....	4
Victor H. .....	do .....	4
Thelma .....	do .....	3
Sweetheart .....	do .....	3
Agnes May .....	do .....	3
Ruth .....	do .....	3
Lady Corinne .....	do .....	2
Ethel T. .....	do .....	2
Geo. S. .....	do .....	2
Pearl .....	do .....	2
Dayton .....	do .....	2
Rambler .....	do .....	1
Bertha K. .....	do .....	1
Trail .....	do .....	1
Lotus .....	do .....	1
Little Era .....	do .....	1
J. E. Johnson .....	do .....	1
Quigg .....	do .....	1
Sunbeam .....	do .....	1
Skate .....	do .....	1
Skipper .....	do .....	1
Elsie .....	do .....	1
Myrtle .....	do .....	1
Blissie May .....	do .....	1
Alice L. Barr .....	Towboat .....	51

## I I 8.

## IMPROVEMENT OF ROUGH RIVER, KENTUCKY.

A complete synopsis of the projects under which the improvement of this river has progressed may be found on pages 2599 to 2602, Annual Report of the Chief of Engineers for 1899.

The work outlined in the existing project has been completed.

Expenditures reported below were for payment of freight charges on lumber for a new derrick boat built during the preceding year.

Commercial statistics are given in the following report for "Operating and care of lock and dam on Rough River, Kentucky."

*Money statement.*

July 1, 1906, balance unexpended.....	\$600. 71
June 30, 1907, amount expended during fiscal year, for maintenance of improvement.....	493. 92
July 1, 1907, balance unexpended.....	106. 79
July 1, 1907, outstanding liabilities.....	17. 27
July 1, 1907, balance available.....	89. 52

## APPROPRIATIONS.

September 19, 1890.....	\$25, 000
July 13, 1892.....	15, 000
August 18, 1894.....	22, 500
June 3, 1896.....	43, 000
Total.....	105, 500

## I I 9.

## OPERATING AND CARE OF LOCK AND DAM ON ROUGH RIVER, KENTUCKY.

The estimate and project for the operation and care of this lock and its appurtenant structures during the fiscal year ending June 30, 1907, contained the following items, the funds for which were made available by allotment July 12, 1906:

Regular force.....	\$709. 55
Repairs, supplies, etc.....	900. 00
Total.....	1, 509. 55

Expenditures during the year were for payment of lock tender, messenger service between the lock and nearest post route; for painting the lock gates; minor current repairs as needed; clearing drift from dam and logs from approaches to the lock; riprapping bank immediately below lower shore crib; removal of snags, trees, etc., from

the river between its mouth and Hartford, Ky. A summary of the latter work follows:

Small trees removed, placed on bank and cut up.....	661
Large trees deadened.....	1
Stumps and snags removed and placed on bank.....	50
Logs removed and placed on bank.....	45
Earth removed and placed on bank, cubic yards.....	974
Miles worked over.....	30

*Summary of expenditures on account of operating and care of Rough River, Kentucky, during the fiscal year 1907, showing general items and amount expended under each heading.*

Items.	Amount.
Services.....	\$1,153.12
Materials.....	92.50
Total.....	1,245.62

## ALLOTMENTS.

July 23, 1897.....	\$2,086.00	July 14, 1904.....	\$1,029.66
July 22, 1899.....	714.97	July 17, 1905.....	1,117.04
July 17, 1900.....	686.31	July 12, 1906.....	1,013.95
July 10, 1901.....	763.66		
August 5, 1902.....	1,079.62	Total.....	9,155.24
July 20, 1903.....	664.03		

## COMMERCIAL STATISTICS.

*Statements of traffic and commerce passing Lock No. 1, Rough River, Kentucky, from July 1, 1906, to June 30, 1907.*

## TRAFFIC.

Kind of boat.	Number.	Tonnage.
Passenger.....	110	1,544
Tow.....	78	1,931
Government.....	14	649
Barges.....	75	18,515
Small craft.....	434	1,243
Rafts.....	144	
Total.....	855	23,882

Total number of lockages during the fiscal year 1907. 763.

## COMMERCE.

Articles.	Quantity.	Articles.	Quantity.
	Tons.		Tons.
Coal.....	56	Cattle.....	30
Corn.....	99	Swine and sheep.....	1
Wheat.....	303	Horses and mules.....	5
Salt.....	42	Lumber.....	181
Oil.....	19	Timber.....	29,519
Flour.....	52	Manufactured iron.....	67
Sugar.....	43	Miscellaneous.....	477
Cement.....	22		
Hay.....	68	Total.....	30,984

Number of passengers, 1,075.

For list of boats plying on this river see page 1818 of this report.

# 1822 REPORT OF THE CHIEF OF ENGINEERS, U. S. ARMY.

*Comparative statement of traffic and commerce at Lock No. 1, Rough River, Kentucky.*

Fiscal year.	Traffic.					Com- merce.
	Steam- boats.	Barges and flats.	Rafts.	Miscella- neous.	Total.	
1891						<i>Tons.</i> 98,161
1892						50,000
1893						75,000
1894						64,401
1895						36,945
1896						30,445
1897						16,538
1898	81	70	178	154	483	15,488
1899	164	29	207	132	532	21,831
1900	260	72	270	168	770	41,411
1901	175	114	121	247	657	20,666
1902	98	105	111	191	505	21,703
1903	128	78	133	235	574	32,919
1904	182	216	115	137	650	33,076
1905	192	219	160	126	697	55,333
1906	257	164	151	308	875	36,800
1907	202	75	144	434	855	30,064

## APPENDIX J J.

### IMPROVEMENT OF RIVERS AND HARBORS ON LAKE SUPERIOR.

REPORT OF MAJ. GRAHAM D. FITCH, CORPS OF ENGINEERS, OFFICER  
IN CHARGE, FOR THE FISCAL YEAR ENDING JUNE 30, 1907.

#### IMPROVEMENTS.

- |  |   |
|--|---|
| 1. Harbor at Grand Marais, Minnesota.                    | 7. Waterway from Keweenaw Bay to Lake Superior, Michigan. |
| 2. Harbor at Agate Bay, Minnesota.                       | 8. Harbor at Marquette, Michigan.                         |
| 3. Harbor at Duluth, Minnesota, and Superior, Wisconsin. | 9. Harbor of refuge, Marquette Bay, Michigan.             |
| 4. Harbor at Port Wing, Wisconsin.                       | 10. Harbor of refuge at Grand Marais, Michigan.           |
| 5. Harbor at Ashland, Wisconsin.                         |   |
| 6. Harbor at Ontonagon, Michigan.                        |   |

UNITED STATES ENGINEER OFFICE,  
*Duluth, Minn., July 6, 1907.*

GENERAL: In compliance with General Orders, No. 2, War Department, Office of the Chief of Engineers, Washington, April 25, 1907, I have the honor to transmit herewith my annual report of the works under my charge in the Duluth, Minn., district for the fiscal year ending June 30, 1907.

Very respectfully,

GRAHAM D. FITCH,  
*Major, Corps of Engineers.*

Brig. Gen. A. MACKENZIE,  
*Chief of Engineers, U. S. A.*

## J J 1.

### IMPROVEMENT OF HARBOR AT GRAND MARAIS, MINNESOTA.

The object of the improvement is to provide a harbor for purposes of refuge and for commerce.

For a description of the harbor and of improvements accomplished, see reports of the Chief of Engineers, United States Army, for previous years.

A few repairs were made to the deck of the east breakwater in September, 1906, at a cost of about \$35.

The available balance, together with the appropriation recommended, will be expended in repairs to the breakwaters and for maintenance.

*Money statement.*

July 1, 1906, balance unexpended.....	\$1, 800. 34
Amount appropriated by river and harbor act approved March 2, 1907.....	5, 000. 00
	<u>6, 800. 34</u>
June 30, 1907, amount expended during fiscal year, for maintenance of improvement.....	137. 02
	<u>6, 663. 32</u>
{ Amount that can be profitably expended in fiscal year ending June 30, 1909, for maintenance of improvement, in addition to the balance unexpended July 1, 1907.....	
Submitted in compliance with requirements of sundry civil act of June 4, 1897, and of section 7 of the river and harbor act of 1899.	
	2, 000. 00

## APPROPRIATIONS.

March 1, 1879.....	\$10, 000	August 18, 1894.....	\$3, 000
June 14, 1880.....	10, 000	June 3, 1896.....	3, 000
March 3, 1881.....	20, 000	March 3, 1899.....	30, 000
August 2, 1882.....	20, 000	June 13, 1902.....	2, 000
July 5, 1884.....	10, 000	March 3, 1905.....	2, 000
August 5, 1886.....	10, 000	March 2, 1907.....	5, 000
August 11, 1888.....	15, 000		
September 19, 1890.....	22, 350	Total.....	172, 350
July 13, 1892.....	10, 000		

## COMMERCIAL STATISTICS.

*Arrivals and clearances of vessels at Grand Marais, Minn., for the calendar year 1906.*

Vessels.	Arrived.	Cleared.	Total.	Estimated net registered tonnage.
Steam.....	612	612	1, 224	428, 400
Increase.....			20	7, 000

Passengers arriving, 2,467; departing, 2,362; total, 4,829.

*Receipts and shipments of freight.*

Receipts.	Tons.	Shipments.	Tons.
Miscellaneous merchandise.....	2, 229	Miscellaneous merchandise.....	759
Coal, hard.....	11	Furs.....	1
Meats.....	256	Fish.....	76
Flour and mill stuffs.....	2, 733	Cedar ties (105,000).....	5, 833
Lumber (29,871 feet).....	45	Cedar poles (98,000).....	11, 625
Shingles (21 M).....	2	Pulp wood (174 cords).....	348
Brick (211 M).....	628	Potatoes (1,100 bushels).....	33
Manufactured iron.....	163	Lumber (4,000,000 feet).....	6, 000
Live stock (814 head).....	91	Shingles (29 M).....	3
		Lath (700 M).....	176
Total.....	6, 068	Total.....	24, 892

Total receipts and shipments, 30,910 tons; decrease, 51,200 tons.

Total valuation, \$970,083; decrease under 1905, \$210,435.

Logs shipped, 17,000,000 feet B. M., valued at \$255,000.

NOTE.—The great falling off in freight tonnage was due to the fact that in 1906 nearly all the pulp wood and more than half the ties and poles were shipped from different points of the shore on either side of Grand Marais, while in 1905 and the two years previous a great deal of this freight was shipped from the harbor.

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## J J 2.

### IMPROVEMENT OF HARBOR AT AGATE BAY, MINNESOTA.

For a detailed description of this harbor see earlier reports of the Chief of Engineers, United States Army.

Repairs to the east breakwater, where damaged by the storm of November, 1905, have been completed. The work consisted of the renewal of the deck, the upper two courses of wall timbers and upper ties, of the easterly 200 linear feet, and a few wall timbers at other points. Repairs were also made at two points where the breakwater had been struck by vessels, the names of the vessels being unknown. The foregoing work was done by J. W. Preston, of Duluth, under agreement, between the dates of May 31 and June 20, 1907. The cost was \$1,644.11.

The case of the *United States v. The Davidson Steamship Company* for damages to the east breakwater caused by the steamer *Shenandoah* in July, 1901, was decided by the Supreme Court of the United States March 25, 1907, favorably to the Government.

This case has been in the courts since the time of the accident, as noted in previous annual reports. The Government charged negligence on the part of the vessel master in not possessing himself of the proper and accessible information as to the presence of the unfinished breakwater on which work was then in progress. The company complained of contributory negligence in a failure of the Government to have proper light on the breakwater. These being questions of fact, the verdict of the jury in the trial court was accepted by the Supreme Court as conclusive. The verdict was for the full amount of damages claimed by the United States, \$4,012.50.

This decision will be of material advantage to the Government in the construction and maintenance of its harbor works of improvement, as it will tend to make navigators more careful in avoiding such collisions.

The Duluth and Iron Range Railroad Company has completed a new coal dock and a pulp-wood dock, has rebuilt the No. 5 ore dock, and has decided to build an additional ore dock, the sixth one, which will be located next to No. 5. This is to be built of steel and will be the only ore dock of steel construction in this country.

The available balance, together with the appropriation recommended, will be expended in repairs to breakwaters and for maintenance.

*Money statement.*

July 1, 1906, balance unexpended.....	\$659.01
Amount appropriated by river and harbor act approved March 2, 1907.....	4,000.00
	<hr/> 4,659.01
June 30, 1907, amount expended during fiscal year, for maintenance of improvement.....	2,542.35
	<hr/> 2,116.66
July 1, 1907, balance unexpended.....	2,116.66
July 1, 1907, outstanding liabilities.....	9.45
	<hr/> 2,107.21
<hr/>	
{ Amount that can be profitably expended in fiscal year ending June 30, 1909, for maintenance of improvement, in addition to the balance unexpended July 1, 1907.....	2,000.00
{ Submitted in compliance with requirements of sundry civil act of June 4, 1897, and of section 7 of the river and harbor act of 1899.	

## APPROPRIATIONS.

August 5, 1886.....	\$22,500.00	June 13, 1902.....	\$2,000.00
August 11, 1888.....	15,000.00	March 3, 1905.....	2,000.00
September 19, 1890.....	25,000.00	March 3, 1905 (allotment).....	500.00
July 13, 1892.....	30,000.00	March 2, 1907.....	4,000.00
August 18, 1894.....	30,000.00	Miscellaneous.....	66.19
June 3, 1896.....	50,000.00		
March 3, 1899.....	71,708.00	Total.....	252,774.19

## COMMERCIAL STATISTICS.

*Arrivals and clearances of vessels at Agate Bay, Minnesota, for the calendar year 1906.*

Vessels.	Arrived.	Cleared.	Total.	Estimated net registered tonnage.
Steam.....	1,568	1,568	3,116	.....
Tow.....	401	401	802	.....
Total.....	1,969	1,969	3,918	17,406,000

Increase in vessels over 1905, 384; decrease in tonnage, 59,000.

Passengers arriving, 7,030; departing, 6,335; total, 13,365.

*Receipts and shipments of freight.*

[Tons of 2,000 pounds.]

Receipts.	Tons.	Shipments.	Tons.
Miscellaneous merchandise.....	9,316	Iron ore.....	9,189,592
Coal, hard and soft.....	279,888	Lumber (58,718 M feet B. M.).....	86,078
Total.....	289,204	Total.....	9,277,670

Total receipts and shipments, 9,566,874 tons; increase, 561,742 tons, equal to over 6 per cent.

Total valuation, \$28,697,943; increase, \$4,327,133, equal to nearly 18 per cent.

Average cargo of iron ore in 1905, 5,832 gross tons.

Average cargo of iron ore in 1906, 5,949 gross tons.

Increase for 1906, 117 tons, equal to 2 per cent.



## J J 3.

## IMPROVEMENT OF HARBOR AT DULUTH, MINNESOTA, AND SUPERIOR, WISCONSIN.

For the history of this harbor and the Government improvements, see Reports of the Chief of Engineers, United States Army, for 1901, Appendix K K, page 2828, and previous years. A detailed description of the condition of channels and other improvements is given in Bulletin No. 17, issued April, 1907, from the office of the Survey of Northern and Northwestern Lakes, pages 43 to 54.

*Shoals.*—The following shoals have been removed from the harbor during the year ending June 30, 1907.

The two shoals mentioned in the Annual Report of the Chief of Engineers for 1906, page 1696, in front of the Hanna coal dock and Boston coal dock, which were caused by the operation of filling these docks with sand, were removed by the owners of the properties during the fall of 1906, and without expense to the Government.

A small shoal was discovered in Duluth Harbor Basin in May, 1907, by a vessel running onto it. It was situated about 75 feet south of the west end of the north pier of Duluth Canal, and had a least depth of 18.3 feet at low water. It was removed by the United States May 11, 1907, at a cost of \$164.58. The work was done by a dipper dredge of the Great Lakes Dredge and Dock Company, at a price of \$25 per hour, including time of towing to and from the work. Amount of material removed was 85 yards. It was rubble and sand, and was probably a point left by the dredge in removing the old north pier eight years ago. It lay between the lines of regular soundings of this locality, and so escaped detection.

The shoaling in the Superior Harbor Basin and Superior Front channel caused by deposits from the Nemadji River, and mentioned in the annual report for 1907, page 1696, increased during the early months of this season and resulted in the grounding of two vessels. Dredging by the United States between the dates of June 6 and 15, 1907, under an informal contract, in order to relieve present necessities, removed some of the worst portion of this shoal, for an area of 2.2 acres. The work was done by the Duluth-Superior Dredging Company, and 23,113 yards were removed, at 12 cents, making a contract cost of \$2,773.56. This dredging will allow vessels drawing 18 feet to use this channel. The removal of the remainder of this shoal will be done under another contract about to be entered into.

*Parking grounds at Duluth Canal, North Park.*—For protection against heavy seas an inner concrete parapet 3 feet high was built along the main concrete pier, for a distance of 540 feet, and provided with three sets of concrete steps for passing over it. The grounds were graded and terraced. A surfacing of black soil was spread over about 90 per cent of the area. Concrete retaining walls, steps, and copings were built around the engineer building. Concrete walks were built throughout the grounds, 6 to 8 feet wide for a linear distance of 1,117 feet. A concrete pavement 6 inches thick was built over the "spillway," an area 27.5 by 125 feet lying between the outer and inner sea walls. A portion of the outer concrete sea wall 37 feet in length, which had settled by reason of a poor foundation, and

was damaged by storms, was rebuilt, and reenforced by steel so as to be self-sustaining. The inner concrete sea wall, which had been damaged by the storm of 1905, was also repaired. Coarse gravel was used for filling places where settlements had occurred by leakage of sand through the piers. The foregoing work was during the fall of 1906.

Grass seed was sown on the north park grounds, and the terrace around the engineer building was turfed, amounting to 446 yards, at 18 cents.

*South Park.*—During May and June, 1907, an inner sea wall was built to a height of 6 feet above the grade of the grounds and founded 5 feet below grade for a protection from waves. It is parallel to the outer sea wall and 38 feet from it; also an inner parapet 520 feet long along the concrete south pier, to a height which varies from 3 feet to 6 feet above the promenade, according to the exposure to waves. There is now under construction a new concrete wall to replace the 105 feet of park wall along the south line of the South Park, which was destroyed by the storm of 1905.

The improvements on the canal parks have been made by hired labor, with the exception of the one item of sodding, which was by contract. Material for concrete (cement, gravel, and sand) and coarse gravel for filling was furnished under contract, after inviting bids in the usual manner. Other material, including lumber for molds, iron for reenforcement and fastenings, was purchased in open market. The cost of the foregoing work at the canal parks for the past fiscal year is estimated at \$9,000. The work is uncompleted and now in progress.

*Maintenance of canal piers.*—Some riprap, to the amount of 3,161 tons, was placed behind the piers at two points where there was no back filling and a washout had occurred during a severe storm, as mentioned in the Annual Report of the Chief of Engineers for 1906, page 1701. Coarse gravel was also used with the riprap to prevent the movement of sand under the piers. This riprap was further intended to strengthen the piers, as the timber cribs, by reason of their elasticity, permitted considerable vibration during severe storms, and the concrete superstructure, having joints between the monoliths separated only by a layer of tarred felt, suffered considerable spawling at the edges, although the alignment of the piers remained perfect and no settlement occurred.

The riprap above mentioned was rock which was excavated in the fall of 1906 from the base of the old south pier at the Superior Entry by the Government scow with derrick and grapple, in the process of removing the old piers, and the rock would have otherwise been wasted. A fair proportion of the cost of tug hire and labor in placing this rock at the canal piers is estimated at \$399.

The coarse gravel placed behind the piers with the riprap as above stated amounted to about 1,000 yards. This was excavated from the north shore of the lake, about one-half mile from canal, by means of the Government scow with derrick and orange-peel excavator, at a cost of \$331. Additional rock and gravel will be required for properly strengthening the piers.

The United States derrick and grapple was also used for the purpose of removing the remaining superstructure of the timber cribwork

of the old abandoned north pier of the Duluth Canal, which stands outside the present concrete pier, down to below the water surface. The cost of this excavation was about \$109.

*Maintenance of the ornamental lamps on the canal piers.*—There are 67 cast-iron lamp-posts. The maintenance of these has included the taking down and storing for the winter 44 of the posts which stood seaward of the shore line, to prevent destruction by storms and the replacing of them in the spring; the renewal of 4 broken posts and 60 incandescent lamps; new fuse, wire, couplings, and the testing and repairs of wiring by electricians. The cost of this for the fiscal year has been about \$563. The electric current for the lamps is furnished by the city of Duluth. The current is turned on for only three or four hours during the early portion of the night and for about three months during the busiest season of passenger travel on the lake.

*Interstate Bridge.*—On August 11, 1906, the steamer *Troy* ran into the draw span of the Duluth-Superior bridge at the Gate, usually known as the Interstate Bridge, causing it to collapse and fall into the water, and closing both draw openings to navigation. To prevent a prolonged stoppage of vessel traffic pending the removal of the wrecked span, which is 485 feet long and 58 feet wide, the Great Northern Railway Company, owner of the bridge, removed the south fixed span, which is 300 feet long and stood over deep water, by means of scows, and placed it on temporary pile piers in shallow water on the west side of the West Gate Basin.

The work of removing the wrecked span and placing it on the draw-rest pier for repairs was commenced by the owners in November, 1906, and has proceeded slowly. At this date (June 30, 1907) the south arm of the span has been placed on the draw rest, but the south opening is not free from obstruction on account of continued wrecking operations. It is doubtful whether the bridge will be rebuilt and ready to operate before the end of this season. This delay, while greatly discommoding interurban traffic, does not affect navigation materially.

The draw span is to be rebuilt on the same plan of construction as before, but under a license from the Secretary of War a change in height has been allowed, and the entire bridge will be raised 3 feet higher, making the clear height 23 feet above low water instead of 20 feet. This change is for the purpose of allowing a greater number of the smaller class of vessels, including tugs, to pass under, and thus reduce the number of occasions for swinging the span, which will be to the advantage of traffic over the bridge.

In regard to the cause of the accident, information obtained by this office shows that the bridge was not opened promptly upon the signal from the vessel, on account of the absence of one of the gate tenders, as was usual at that hour of the night (between 1 and 2 o'clock). It is claimed, on the other hand, that the vessel was approaching the bridge at too high a speed.

The owners of the bridge commenced a suit in law to recover damages from the steamer, and both parties collected evidence. The only result of the litigation thus far known to this office has been to settle the question of jurisdiction in the trial courts.

Request was made by this office October 18, 1906, to the United States district attorney at St. Paul, Minn., that proceedings be com-

menced for the prosecution of the owner of the bridge for failure to open the bridge upon a signal from the vessel, and facts were cited indicating gross negligence. The reply of the United States attorney stated that he would be glad to consider the case submitted by my letter at the earliest opportunity, but so far I have not been advised of any action taken in the matter.

*Northern Pacific Railroad bridge.*—This bridge crosses St. Louis Bay one-half mile west of the Gate. A revocable license was granted by the Secretary of War March 24, 1906, for rebuilding this bridge, with an increase in the size of the draw openings from the present width of 100 feet to 125 feet, and for placing the Wisconsin span center about 190 feet farther to the north. Later it came to the knowledge of this office that the vessel interests were dissatisfied with the proposed width of the draw openings and with the location of the Minnesota draw span. On looking into the matter I became convinced that these objections were not without reason and should be considered. A careful investigation was then made (in October, 1906), in which the vessel interests and also representatives of the railway company were given full opportunity to express their views. The conclusion was reached that the plans should be altered, and recommendations were made in my report to the Chief of Engineers, dated October 22, 1906, that the license of March 24, 1906, be revoked, that the draw openings be increased to 175 feet, and that certain changes be made in the position of the Minnesota spans. An indorsement by the Chief of Engineers concurred in the desirability of said changes, and a request addressed by the Secretary of War to the president of the Northern Pacific Railway Company, dated November 1, 1906, resulted in the abandonment of the plans under which the company had already begun the work of construction, and the adoption of the changes recommended. In accordance with the foregoing, new plans were submitted by the railway company January 5, 1907, and the same were approved by the Secretary of War January 22, 1907. These plans provide for two openings of 175 feet each (instead of the present widths of 100 feet) at each of the two draws. The center of the Minnesota draw will be about 215 feet farther south than it is at present, and the rafting span (with an opening of 150 feet) will be placed between the draw span and the shore of Rices Point; that is, north of the draw span instead of, as at present, south of the draw. The center of the Wisconsin draw will be placed about 250 feet north of its present position. These changes in position of draw spans are to facilitate the movement of vessels in passing through the two bridges, which are one-half mile apart, and also to enable vessels to enter and leave more easily the slips immediately to the west of the Wisconsin draw.

The permit of the Secretary of War requires that the work of reconstruction shall be completed by the opening of navigation in the spring of 1908.

The Government has made arrangements for dredging in the vicinity of the Northern Pacific bridge in order to adapt the channels to the altered positions of the draw spans.

On November 18, 1906, the steamer *James E. Davidson* collided with the south pier of the Minnesota draw span of the Northern Pacific bridge, completely wrecking the pier and the 160-foot fixed

span adjoining the draw span to the south, the north end of which rested on this pier. The draw was open at the time of the accident and was uninjured. The company removed the fragments of the wrecked pier which obstructed the channel, and built a temporary pile trestle where the fixed span stood to support the railroad track. The wrecked span lay in the water, out of the path of vessels, until May, 1907, when it was removed by the railway company. No particular cause or reason has been assigned for the last-named accident, but collisions with the piers of this bridge have been of frequent occurrence. Less than three weeks previously the same pier was struck by the schooner *John Fritz*, October 30, 1906, and damaged so as to prevent the passage of trains for a time. The present width of draw openings leaves insufficient margin for the movement of vessels, and the bridge piers are rather unsubstantial.

*Rules and regulations.*—By authority of the Acting Secretary of War, under date of August 23, 1906, the rules for this harbor were amended by inserting a paragraph requiring vessels to give a signal when approaching the Aerial Bridge.

In view of recent serious bridge accidents in this district, it was deemed advisable to revise the rules of this harbor with special reference to signals for opening bridges and the speed of vessels while navigating channels, with a view to securing greater safety in the passage of bridges by vessels, and this revision was undertaken during the winter months of 1906-7. A preliminary draft of proposed rules was prepared after a careful study of the subject and submitted to 68 firms and individuals, including vessel men, railroad and city officials, and others supposed to be interested, inviting comments. This elicited numerous responses, containing words of approval or criticism or further suggestions. Whenever the criticisms seemed well founded, changes were made. The draft of rules received further modifications in the office of the division engineer, and finally by the Chief of Engineers. These rules and regulations were issued by the Acting Secretary of War under date of April 13, 1907, to be in force from and after May 1, 1907, and the same were printed and given publicity in the manner prescribed by law. They can be found on pages 1-9, Supplement No. 1, 1907, to Bulletin No. 17, issued by the Lake Survey Office at Detroit, Mich.

*Examination of channels.*—Soundings were taken through the ice during the winter of 1906-7 at a number of places where shoaling was thought possible to have occurred either from natural causes or from the escape of material used by private parties in the operation of filling wharves. Among the localities examined were the following:

Minnesota channel, St. Louis River, from the Grassy Point Bridge up to the north side of Spirit Lake, a distance of  $4\frac{1}{2}$  miles. This channel from its location is considered liable to shoaling in case of a heavy flood in the river. Such a flood has not occurred since the completion of this channel in 1902. The soundings taken in December, 1906, show no shoaling of importance. There is a little next to the left or westerly bank at the upper end of the curve near the outlet of Spirit Lake, but not enough to form an obstruction.

North channel of St. Louis Bay and the Superior Front channel in Superior Bay in vicinity of the Boston coal dock, Hanna coal dock,

and the Northwestern coal dock No. 1; the West Gate Basin, where cables had been placed in a trench, where material had been dredged for filling, and for placing a bridge span on temporary supports; at some new slips; in the Superior Front channel and the Superior Harbor Basin, where shoaling had occurred by deposits from the Nemadji River; the Duluth Canal and the Superior Entry.

*Other soundings.*—Soundings were taken in the lake at Superior Entry to cover the area where breakwaters are to be constructed. Soundings were also taken in the lake at Duluth, covering an area of about 2 miles by 3 miles, and in the harbor adjoining the Duluth Harbor Basin, to secure data (when it could best be obtained by soundings through ice), which it was expected would be required, for an investigation of the needs of Duluth Harbor.

An ice-boring machine was used for the greater part of this work. A total of 32,170 soundings were taken during the winter at an average cost for field work of 4 cents for each sounding.

*Stability of Minnesota Point.*—The shore line of Minnesota Point was surveyed in September, 1906, and a comparison made of the average position at the time of four surveys made in the years 1874, 1885, 1902, and 1906.

The most important result is that for the portion of the Point where no dumping of dredged material has been done on the lake front (a distance of about 3 miles) there has been some advance of the shore line seaward during each interval between two consecutive surveys. The rate of this advance seaward has been diminishing with time, so that during the last interval the position has been nearly stationary. During the first interval of twelve years the advance seaward was 13 feet, showing a rate of 1.1 feet annually. In the second interval, seventeen years, the advance was 7 feet, or 0.4 foot per year. In the third interval, four years, the advance was 2 feet, or 0.5 foot per year.

This tendency to advance seaward, even though at a rate recently so small as to be practically stationary, argues for the permanency of this narrow strip of land, as far as regards the action of storm waves in Lake Superior.

For those portions of Minnesota Point where dredgings have been deposited on the lake front the advance of the shore line has been greater and in accordance with the amount of the deposits. The maximum advance since 1874 has been about 300 feet, which is at a point about 1 mile from the Duluth Canal.

On the harbor side of Minnesota Point there has been along much of the distance a very considerable erosion during the above-mentioned term of years. Several causes may have contributed to this: (a) The cutting of the Duluth Canal, in 1871, which diverted the current of the St. Louis River to the northerly portion of Superior Bay, where there was formerly comparatively quiet water; (b) the instability of the soil, some of which is boggy; (c) swells coming in through the Duluth Canal during storms, which attack the shore with considerable severity for a distance of half a mile or so from the entrance; (d) the action of waves generated within the harbor; (e) the prevalence of high stages of water in recent years, which intensifies the effect of wave action.

*Superior Entry.*—The contract for dredging part of the trench for the new south concrete pier was completed on August 11, 1906. Work was commenced on the trestle and bearing piles for the pier beyond the shore line on August 6 and prosecuted until August 17. Concrete work was begun on August 16, but discontinued on August 21, when all work on the south pier was suspended by direction of the Chief of Engineers, pending the consideration of a report by a Board of Engineers ordered by act of Congress June 20, 1906. The refilling of the pier trench south of the concrete pier was completed by means of the 15-inch sand pump. A large derrick scow equipped with a rock grapple and a deck scow, both for use at Superior Entry, were built, also a smaller derrick scow for use at Portage Lake Canal.

The project for improving Superior Entry having been modified and enlarged by the Secretary of War, acting under the authority conferred by the act of March 2, 1907, in accordance with the report submitted by a Board of Engineers in House Document No. 82, Fifty-ninth Congress, second session, work on the extension of the south concrete pier was not resumed.

Under the former project for constructing concrete piers at the Superior Entry work was prosecuted from the spring of 1903 until discontinued, as above stated, in August, 1906. A description of this project, with detailed drawings of plans of construction and of plant employed and photographic views of various stages of the operations, is given in the Annual Report of the Chief of Engineers for 1904, Appendix A A A, Technical details, page 3779. The plans and description therein given show the south pier alone, which was under construction, but the same plan was to be followed for the north pier. The two piers were to be 300 feet apart and extend an equal distance into the lake.

The new project for the improvement of this entrance, as approved by the Secretary of War April 5, 1907, is outlined in the following extract from the report of the Board (Document No. 82), pages 11 and 12:

Stop work upon the new south pier, which does not yet project beyond the shore line and which will then constitute a revetment not inconsistent with the plan hereinafter proposed. Build a similar revetment on the opposite side of the channel, leaving a 500-foot opening.

Beginning in 30-foot depth of water, with an opening 600 feet wide in the clear and with the axis of this opening coincident with that of the 500-foot opening between revetments, construct piers diverging toward the shore, all as shown on the tracing.

For purposes of estimate the north revetment has been regarded as of solid concrete on pile foundation; the outer 450 feet of each pier as of concrete superstructure on wooden cribs with pile foundation; the inner portions of the piers as of pile pier construction, tied across below the water, and adapted to concrete superstructure; the rest of the piers as of rubble mound. The proposed cross sections of pile pier and rubble mound, as well as the length of each estimated upon, are shown on the tracing.

In making the estimate it has been assumed that the new south pier (revetment) will be removed outside the point marked "a" on the tracing, and that the new north revetment will terminate directly opposite the same point.

The dredging in the estimate includes the following: (a) Excavating the channel between the pier and revetment openings to 600 feet width and 30 feet depth; (b) excavating the channel between the revetments to 24 feet; (c) removing material from the area between the proposed south pier and the proposed south revetment, with a view to securing a suitable stilling basin, part of this (or other) waste material to be spoiled near the shore between the proposed north pier

and the proposed north revetment, so as to produce a certain symmetry of conditions with regard to the axis of the channel; (d) widening the channel on its north side leading inward from Superior Entrance, as shown on tracing No. 3. The quantity of riprap provided in the estimate includes that required for protecting the shores of Minnesota Point immediately north and south of the proposed entrance, and that which may be required for holding the shores of the stilling basin inside the piers.

The estimate of the Board for the work proposed at and near Superior Entrance is as follows:

Pile pier in water, and riprap, 600 linear feet, at \$42-----	\$25, 200. 00
Pile pier on land, 1,350 linear feet, at \$20-----	27, 000. 00
Rubble mound, 4,420 linear feet, 238,878 cubic yards, at \$2-----	477, 756. 00
Crib and concrete pier, cribs 30 feet wide, with riprap, 750 linear feet, at \$306-----	229, 500. 00
Pierheads, concrete on cribs, 40 feet wide, one 100 feet long and one 50 feet long, total 150 linear feet-----	76, 950. 00
Removing outer 300 feet of south concrete revetment, 4,100 yards, at \$5-----	20, 500. 00
North concrete revetment, 1,450 linear feet, at \$115-----	166, 750. 00
Removal of old timber cribs, 4,900 linear feet, at \$10-----	49, 000. 00
Dredging entrance channel and stilling basin, 1,135,370 cubic yards, at 18 cents-----	204, 366. 00
Dredging north side inner channel, as shown on tracing No. 3, 514,943 cubic yards, at 12½ cents-----	64, 368. 00
Riprap for revetments, 38,888 cubic yards, at \$2-----	77, 776. 00
	<hr/>
	1, 419, 166. 00
Administration and contingencies, 20 per cent-----	283, 833. 20
	<hr/>
Total-----	1, 702, 999. 20
Aids to navigation-----	100, 000. 00

While the Board has been obliged to select certain types of pier for purposes of estimate, it is recognized that changes of condition and of unit prices may occur, and it is believed that the district officer should be authorized to select such types of piers and such materials as may be most advantageous when work is actually commenced. Furthermore, it is believed that work should proceed tentatively so far as concerns the length of the revetments and the dredging and filling within the stilling basin. It may not be necessary to cut down any of the new south revetment, and it may not be necessary to produce symmetrical conditions within the stilling basin to the extent provided in the estimates.

In taking up the work of executing this project, a few modifications have been made in the Board's plan, relating to minor details only, and these are here briefly stated, as follows:

(a) Larger stones are to be used for the upper portion of the facing or covering, if economically practicable.

(b) The entire south concrete revetment will remain as now built (instead of removing the outer 300 feet), and the north revetment will be built to an equal distance into the lake.

The entrance to these revetments will then be 1,900 feet from the outer entrance. The width of the outer entrance is to be 600 feet and the width of stilling basin at the entrance to the revetments is 2,500 feet, measured on the arc of a circle described from the outer entrance as a center. With this data the Stevenson formula for the reduction of waves would give 0.29 for the height of the reduced waves, expressed as a fraction of the height of waves in the lake. Some allowance should be made for conditions which render the formula not strictly accurate, so that the reduced height may be as much as one-third, or even more, of the original height.

(c) The pile pier at the inner end of the south arm of the breakwaters will extend a less distance ashore, making the portion on land



300 feet, or less, instead of 950 feet, as the shore is constantly advancing.

The construction of the seaward ends of the breakwaters will closely follow the plans on which the Duluth Canal piers were built, both as to the substructure cribwork and the concrete superstructure, except as to some of the general dimensions.

Work has been commenced the present season on the construction of the north concrete revetment by the excavation of the pier trench, which is now in progress, and some preparatory work has been done toward the building of the seaward ends of the breakwaters by deepening a slip in which the timber cribs will be constructed and by contracting for timber to be furnished. Proposals were invited May 24, 1907, for building the rubble mound of the north breakwater, but no bids were received. The large size of some of the pieces of rock called for seems to make this work unattractive to contractors.

The construction of a large tug for use on the Superior Entry work having been recommended by this office and approved by the Chief of Engineers, proposals were invited and advertised in due form, but only one bid was received, and that one was too high to be considered. The same party has since then submitted another bid which is much lower, and this has been recommended for acceptance.

The removal of riprap from the base of the old Superior Entry piers, which lie within the limits of the proposed new entrance channel, was commenced in the fall of 1906, with the use of the Government stone grapple. This work was resumed in the spring of 1907 and is now in progress. A portion of this riprap was placed at the rear of the Duluth Canal piers, as stated elsewhere in this report, and the remainder (amounting to 2,000 tons) has been used toward building the rubble mound of the south arm of the Superior Entry breakwater.

The work at Superior Entry has been, as heretofore, under the immediate charge of Mr. Clarence Coleman, assistant engineer.

*Commerce.*—The system of vessel reports which was inaugurated in 1895 has been kept up, and the commercial statistics accompany this report. These are as accurate as is practically possible to make them, being compiled from the individual reports of each trip of every vessel, in or out, made directly to this office.

These data are considered of much value by the public, as evidenced by the great demand upon this office for copies from railroad corporations, vessel agencies, commercial organizations, publishers of trade and technical journals, and others, a demand which is increasing yearly. The reports are mimeographed in this office for gratuitous distribution.

It is worthy of notice that the freight tonnage for the calendar year 1906 shows an increase of 28 per cent over that of the previous year, and that it amounts to 56 per cent of the freight passing the Sault locks in the same year.

*Harbor patrol.*—A systematic supervision of the harbor has been in operation since August 22, 1906, by Mr. H. C. Bellinger, harbor inspector. The duties of the inspector are to enforce the rules and regulations pertaining to the harbor, with special reference to injurious deposits, encroachments by wharf construction, speed of vessels, obstruction of channels by rafts, assignment of position to vessels in

the anchorage basin, etc., and the securing of evidence in case of violations.

The harbor inspector made use of a gasoline launch, which was on hand, for the first few months in patrolling the harbor, and since November 7, 1906, has used the U. S. steam launch *Tangent*, which was transferred from Houghton to this harbor for that purpose. This launch is 42 feet long, has a small cabin, without accommodations, and is not just what is needed, but is economical in expense and can be used for the present. The crew numbers two, a pilot and a steam engineer. Very effective work is accomplished by the inspector.

*Private improvements.*—Among the larger of the private improvements on this harbor completed during the year ending June 30, 1907, are the following:

The Duluth, Missabe and Northern Railway iron-ore dock No. 4. The length of the dock proper is 2,304 feet, and the capacity of the pockets 119,274 long tons.

The Great Northern Railway Company's iron-ore dock No. 1, at Allouez Bay, rebuilt and enlarged. Present length of dock proper, with shipping pockets, 2,280 feet. Capacity, 100,980 long tons.

Northern Coal and Dock Company's coal dock on Connors Point, Superior Bay. Width 600 feet, length about 1,000 feet, reaching to the harbor line.

Peavy elevator, Rices Point, Superior Bay. Capacity, 660,000 bushels. Built of reenforced concrete, reenforced tile, and of steel, to replace a wooden elevator which was destroyed by fire.

Northern Pacific Railway Company's lumber wharf, Rices Point, St. Louis Bay. Size 26 by 878 feet. Has two tracks. For transferring lumber from cars to vessels.

The laying of the city water and gas mains under the Duluth Canal, mentioned in the last annual report, was completed during the winter of 1906-7.

Among private improvements under construction June 30, 1907, are the following:

Coal dock, by the Duluth, Missabe and Northern Railway Company, on St. Louis Bay, near the ore docks of that company. Size to be 604 feet by 1,800 feet. Will be used for supplying iron mines and the railroad.

Berwind-White coal dock, south side of St. Louis Bay, three-fourths mile west of the Northern Pacific railroad bridge. To extend from shore out 1,200 feet, with a width of 455 feet.

Pennsylvania and Reading coal dock, Connors Point, St. Louis Bay. To extend to the harbor line, a length of 1,157 feet and width of 673 feet.

The Duluth, Missabe and Northern Railway Company are dredging a deep channel across the flats of St. Louis Bay from the North channel at the Missabe ore docks to the South channel near the Pittsburg coal dock No. 6, under license from the Secretary of War dated October 30, 1905. The object of this channel is to enable the ore-carrying vessels to approach the interstate bridge more nearly at right angles to the direction of the bridge and lessen the danger of collision with the draw span and draw rest of the bridge. Work on this channel has been in progress since November, 1905, and is ex-



DULUTH HARBOR BASIN. FLEET OF VESSELS AT ANCHOR, APRIL, 1907.



pected to be completed in July, 1907. This work is under the supervision of the engineer officer in charge of the Duluth district, and the channel is to be open to the free navigation of all vessels or craft of whatever kind.

Among projected private improvements are one or two of considerable magnitude, and deserving of mention here.

The United States Steel Corporation has decided the present year to establish a plant at Duluth, which will include a blast furnace, several open-hearth furnaces, mills for making structural steel and steel rails, by-product coke ovens, coal docks, shops, cement plant, etc., at a cost of six to ten million dollars. A site for this plant, 1,600 acres in extent, has been purchased on the westerly side of Spirit Lake, and it is stated that the work of construction will begin this season.

The Wisconsin Central Railway Company is extending its line to the head of the Lakes, which will give another line between Duluth and Superior and Chicago. The road is expected to reach Superior before next winter. The right of way for terminals in Duluth has been purchased or condemned, and the cost of these terminals has been estimated at two and one-half to three million dollars.

### *Money statement.*

July 1, 1906, balance unexpended.....	\$333, 962. 42
Amount appropriated by river and harbor act March 2, 1907.....	725, 000. 00
Amount appropriated by sundry civil act approved March 4, 1907..	200, 000. 00
Miscellaneous receipts, sales, etc.....	2, 000. 00
	<hr/> 1, 260, 962. 42
June 30, 1907, amount expended during fiscal year:	
For works of improvement.....	\$75, 479. 60
For maintenance of improvement.....	30, 677. 24
	<hr/> 106, 156. 84
July 1, 1907, balance unexpended.....	1, 154, 805. 58
July 1, 1907, outstanding liabilities.....	20, 000. 00
	<hr/> July 1, 1907, balance available.....1, 134, 805. 58
	<hr/>
July 1, 1907, amount covered by uncompleted contracts.....	55, 000. 00
Amount (estimated) required for completion of existing project..	827, 999. 20
	<hr/>
Amount that can be profitably expended in fiscal year ending June 30, 1909, in addition to the balance unexpended July 1, 1907:	
For works of improvement.....	\$354, 540. 00
For maintenance of improvement.....	41, 000. 00
	<hr/> 395, 540. 00
Submitted in compliance with requirements of sundry civil act of June 4, 1897, and of section 7 of the river and harbor act of 1899.	

# 1838 REPORT OF THE CHIEF OF ENGINEERS, U. S. ARMY.

## APPROPRIATIONS.

### HARBOR AT DULUTH, MINN., AND SUPERIOR, WIS.

June 3, 1896-----	\$50,000.00	June 13, 1902-----	\$200,000.00
June 4, 1897 (sundry civil act)-----	437,500.00	March 3, 1905-----	270,000.00
July 1, 1898 (sundry civil act)-----	770,138.00	June 30, 1906 (sundry civil act)-----	100,000.00
March 3, 1899 (sundry civil act)-----	300,000.00	March 2, 1907-----	725,000.00
June 6, 1900 (sundry civil act)-----	793,187.50	March 4, 1907 (sundry civil act)-----	200,000.00
March 3, 1901 (sundry civil act)-----	320,000.00	Miscellaneous receipts---	2,667.50
June 28, 1902 (sundry civil act)-----	459,727.50		
		Total -----	4,628,220.50

The following statement shows the manner in which the appropriations have been expended since June 30, 1896; the amount expended under the different classes of work includes the cost of soundings, superintendence, buoying, and contingencies:

Dredging and maintenance-----	\$2,179,510.95
Duluth Canal piers-----	650,000.00
Wisconsin Entry piers-----	494,092.78
Purchase of land-----	107,061.19
Vessel-yard construction-----	17,750.00
Engineer building-----	25,000.00
Total-----	3,473,414.92

### HARBOR AT DULUTH, MINN.

March 3, 1871-----	\$60,000.00	August 2, 1882-----	\$45,000.00
June 10, 1872-----	50,000.00	July 5, 1884-----	45,000.00
March 3, 1873 (allotted)---	36,049.20	August 5, 1886-----	58,250.00
June 23, 1874-----	10,000.00	August 11, 1888-----	80,000.00
March 3, 1875-----	35,000.00	September 19, 1890-----	100,000.00
August 14, 1876-----	15,000.00	July 13, 1892-----	125,000.00
June 18, 1878-----	30,000.00	August 18, 1894-----	75,000.00
March 3, 1879-----	25,000.00		
June 14, 1880-----	25,000.00	Total -----	852,299.20
March 3, 1881-----	40,000.00		

The following statement shows the manner in which the appropriations have been expended. The amount expended under the different classes of work includes the cost of soundings, superintendence, buoying, and contingencies:

#### Total amount expended to June 30, 1897:

Breakwater-----	\$110,000.00
Dredging-----	644,638.55
Canal piers, etc-----	97,660.65
Total-----	852,299.20

#### Expended prior to present project:

Breakwater-----	110,000.00
Canal piers, etc-----	45,698.33
Dredging-----	122,354.05
Total-----	278,052.38

#### Expended under the project adopted in 1881:

Canal piers, etc-----	51,962.32
Dredging-----	522,284.50

Total-----

574,246.82

## HARBOR AT SUPERIOR BAY AND ST. LOUIS BAY, WISCONSIN.

March 3, 1867-----	\$63,000.00	June 14, 1880-----	\$5,000.00
April 10, 1869-----	45,000.00	March 3, 1881-----	10,000.00
July 7, 1870-----	40,000.00	August 2, 1882-----	40,000.00
March 3, 1871-----	60,000.00	July 5, 1884-----	45,000.00
June 10, 1872-----	50,000.00	August 5, 1886-----	22,500.00
March 3, 1873 (allotted)-----	63,950.80	August 11, 1888-----	50,000.00
Allotted from appropriations for "Repairs of harbors on northern lakes"-----	5,433.00	September 19, 1890-----	65,000.00
August 14, 1876-----	3,000.00	July 13, 1892-----	70,000.00
June 18, 1878-----	3,000.00	August 18, 1894-----	50,000.00
March 3, 1879-----	5,000.00	Total-----	695,883.80
		Aggregate-----	6,176,403.50

## EXPENDITURES.

Amount expended under original project, adopted in 1867-----	\$258,000.00
Amount expended under project recommended by Board of Engineers in 1873-----	77,513.26
Amount expended under present project to June 30, 1897-----	360,370.54
Total-----	695,883.80

The following statement shows the manner in which the appropriations have been expended. The amount expended under the different classes of work includes the cost of examination, soundings, superintendence, buoying, and contingencies.

Repairs and beach protection-----	\$13,233.00
Construction and repair to piers-----	334,278.64
Dredging-----	348,372.16
Total-----	695,883.80

## LIST OF EXISTING CONTRACTS.

Contract was entered into with the Illinois Steel Company, of Chicago, Ill., dated January 30, 1903, approved by Chief of Engineers February 21, 1903, for furnishing 65,000 barrels of Portland cement for Superior Entry piers, south side, at \$2.17 per barrel, delivered in sacks (four sacks to the barrel), less 10 cents each for sacks returned; delivery to commence May 1, 1903, and be completed by October 15, 1904. Time of completion waived for a reasonable period by indorsement of the Chief of Engineers, dated October 4, 1904.

Contract was entered into with George A. Wieland, of Duluth, Minn., dated June 15, 1903, approved by Chief of Engineers July 9, 1903, for furnishing and delivering in stock pile at Superior Entry, Wisconsin, 43,000 cubic yards of pebbles or gravel at \$1.08½ per cubic yard; delivery to commence July 1, 1903; to continue at rate of 5,200 cubic yards per month during season of navigation, making a total of 20,800 cubic yards to be delivered during season of 1903. During season of 1904 delivery to be at rate of 5,550 cubic yards per month until 22,200 cubic yards have been delivered. Time of completion waived for a reasonable period by authority of Chief of Engineers, dated September 28, 1904 (E. D. 46811/19).

Emergency contract with Northwestern Steam Boiler and Manufacturing Company, of Duluth, Minn., dated December 27, 1906, for furnishing and placing boiler in U. S. S. *Vidette* for \$2,300. Work to commence promptly and to be completed May 1, 1907. Time limit waived for a reasonable period by authority of Chief of Engineers April 27, 1907.

# 1840 REPORT OF THE CHIEF OF ENGINEERS, U. S. ARMY.

## COMMERCIAL STATISTICS.

*Marine commerce for Duluth, Minn., for calendar year 1906.*

Class.	Entered.	Departed.	Total.	Net registered tonnage.
Propellers.....	4,182	4,201	8,383	19,846,056
Tow barges.....	464	468	932	1,146,832
Total.....	4,646	4,669	9,315	20,492,890

Net registered tonnage entered, 10,233,209; departed, 10,259,681.

*Freight received and shipped, and estimated value of same.*

[Tons of 2,000 pounds.]

	Tons.	Value.
Receipts.....	2,094,099	\$45,765,951
Shipments.....	14,424,101	88,138,253
Total.....	16,518,200	133,904,204

Number of passengers:

Arriving..... 45,844  
Departing..... 44,645

Total..... 90,489

*Arrivals and departures for each month, with net registered tonnage.*

Month.	Arrivals.	Departures.	Total.	Tonnage.
January.....	18	15	33	3,426
February.....	5	4	9	6,160
April.....	259	243	502	1,183,788
May.....	472	506	978	1,954,524
June.....	634	659	1,293	2,644,866
July.....	715	703	1,418	2,902,664
August.....	679	680	1,359	2,829,867
September.....	619	616	1,235	2,877,138
October.....	601	598	1,199	2,917,546
November.....	511	509	1,020	2,578,089
December.....	188	136	269	689,820
Total.....	4,646	4,669	9,315	20,492,890

*Comparative statement for calendar years 1905 and 1906.*

Year.	Arrivals.	Departures.	Total.	Registered tonnage.	Average tonnage.
1905.....	4,345	4,343	8,688	16,326,771	62,113
1906.....	4,646	4,669	9,315	20,492,890	62,384
Increase over 1905.....	301	326	627	4,166,119	266

\* Steam, 7,624; tow, 1,064.

<sup>b</sup> Exclusive of tugs.

<sup>c</sup> Steam, 8,383; tow, 932.

*Vessels, tonnage, and freight recorded at Duluth Canal.*

[Tons of 2,000 pounds.]

Vessel.	Number.	Registered tonnage.	Tons of cargo.
Entering.....	4,443	10,039,099	5,659,287
Departing.....	4,071	8,812,495	15,627,246
Total.....	8,514	18,851,594	21,286,533



*Receipts and shipments of freight by lake, naming principal commodities, for calendar year 1906.*

[Tons of 2,000 pounds.]

Articles.	Duluth.	Superior.	Total.
<b>RECEIPTS.</b>			
Cement and limestone .....	90,183	43,407	133,590
Coal, hard and soft .....	1,601,166	3,723,374	5,324,540
General merchandise and fish .....	154,030	80,775	234,805
Manufactured iron and machinery .....	141,081	112,135	253,216
Miscellaneous .....	3,809	7,762	11,571
Oil and salt .....	46,994	42,038	89,032
Piles, poles, ties, and posts .....	6,418	21,631	28,049
Sand, gravel, and stone .....	50,418	22,493	72,911
<b>Total receipts</b> .....	<b>2,094,099</b>	<b>4,053,615</b>	<b>6,147,714</b>
<b>SHIPMENTS.</b>			
Copper, coal, and iron .....	1,073	17,340	18,413
Flaxseed .....	339,774	289,064	628,838
Flour .....	205,096	338,693	543,729
Grains (except flax and wheat) .....	124,369	362,255	486,624
Iron ore .....	12,498,083	6,870,158	19,368,186
Lumber .....	604,161	66,261	670,422
Miscellaneous merchandise .....	42,235	16,141	58,376
Shingles and lath .....	28,475	31,925	60,400
Wheat .....	576,171	608,168	1,184,339
Wool .....	4,714	4,463	9,177
<b>Total shipments</b> .....	<b>14,424,101</b>	<b>8,569,406</b>	<b>23,023,507</b>

\* Not including logs—Duluth, 26,535,000 feet; Superior, 365,000 feet.

Total receipts and shipments, 29,171,221 tons; increase, 6,495,076 tons, equal to 28.64 per cent.

Total valuation, \$251,899,844; increase, \$55,148,261, equal to 21.9 per cent.

Total arrivals and departures, 14,854; increase, 305.

Total registered tonnage, 32,842,351; increase, 6,626,197.

*Receipts and shipments, with valuations, for 1906, Duluth and Superior combined.*

Description of cargo.	Quantity.	Unit price.	Valuation.
Barley, oats, rye, and corn .....	bushels. 21,898,079	\$0.42	\$9,197,193
Cement .....	barrels. 341,896	2.00	683,792
Coal, hard .....	tons. 888,572	6.25	5,553,676
Coal, soft .....	do. 4,436,968	3.65	16,191,284
Copper .....	do. 17,474	400.00	6,989,600
Fish .....	do. 2,285	80.00	182,800
Flaxseed .....	bushels. 22,458,502	1.16	26,051,862
Flour .....	barrels. 5,387,292	3.85	20,741,074
General merchandise .....	tons. 282,432	175.00	49,425,600
Gravel .....	cubic yards. 20,176	1.00	20,176
Iron, manufactured .....	tons. 250,505	78.00	19,539,390
Iron ore .....	do. 19,368,186	2.50	48,420,464
Lath .....	M. 32,082	3.75	120,308
Limestone .....	tons. 65,211	1.50	97,816
Logs .....	M feet. 26,900	15.00	403,500
Lumber .....	do. 447,276	19.35	8,654,772
Machinery .....	tons. 3,436	375.00	1,288,125
Oil .....	barrels. 186,190	6.75	919,282
Poles, cedar .....	number. 173,121	1.75	302,962
Salt .....	barrels. 432,556	.75	324,416
Sand .....	cubic yards. 29,133	.70	20,393
Shingles .....	M. 523,910	3.00	1,571,730
Stone, building .....	tons. 7,706	5.60	43,154
Ties, railroad .....	number. 95,651	.52	49,739
Wheat .....	bushels. 39,477,971	.76	30,008,258
Wool .....	tons. 9,177	560.00	5,139,120
Miscellaneous .....	do. 20,301		367,958
<b>Total valuation</b> .....			<b>252,303,844</b>

# 1842 REPORT OF THE CHIEF OF ENGINEERS, U. S. ARMY.

## Marine commerce for Superior, Wis., for calendar year 1906.

Class.	Entered.	Departed.	Total.	Net registered tonnage.
Propellers.....	2,588	2,569	5,157	11,607,414
Tow barges.....	192	190	382	742,047
Total.....	2,780	2,759	5,539	12,349,461

Net registered tonnage entered, 6,168,333; departed, 6,181,128.

*Freight received and shipped, and estimated value of same.*

[Tons of 2,000 pounds.]

	Tons.	Value.
Receipts.....	4,053,615	\$40,301,508
Shipments.....	8,599,406	77,694,187
Total.....	12,653,021	117,995,640

Number of passengers:

Arriving.....	3,238
Departing.....	3,217
Total.....	6,455

*Arrivals and departures for each month, with net registered tonnage.*

Month.	Arrivals.	Departures.	Total.	Tonnage.
April.....	150	172	322	817,343
May.....	250	254	504	1,103,270
June.....	861	867	1,728	1,507,584
July.....	412	399	811	1,639,420
August.....	379	373	752	1,645,775
September.....	350	346	696	1,690,945
October.....	378	368	747	1,830,321
November.....	398	378	776	1,717,438
December.....	101	100	201	497,416
Total.....	2,780	2,759	5,539	12,349,461

*Comparative statement for calendar years 1905 and 1906.*

Year.	Arrivals.	Departures.	Total.	Registered tonnage.	Average tonnage.
1905.....	2,447	2,414	4,861	9,889,383	62,250
1906.....	2,780	2,759	5,539	12,349,461	62,473
Increase.....	333	345	678	2,460,078	223

\* Steam, 4,012; tow, 457.

<sup>b</sup> Exclusive of tugs.

\* Steam, 5,157; tow, 382.

*Vessels, tonnage, and freight recorded at Wisconsin Entry.*

[Tons of 2,000 pounds.]

Vessels.	Number.	Registered tonnage.	Tons of cargo.
Entering.....	1,159	2,542,179	488,327
Departing.....	1,512	3,763,883	7,396,261
Total.....	2,671	6,306,012	7,884,588

*Vessel report in detail for Superior Harbor.*

## ENTERING.

Manner of entering.	Boats.	Registered tonnage.	Tons of cargo.
Number which entered Superior Harbor loaded via Duluth Canal	1,152	2,588,541	3,588,527
Number which entered Superior Harbor light via Duluth Canal	469	1,037,613	.....
Number which entered via Wisconsin Entry and discharged at Superior	185	252,749	a 470, C88
Number which entered via Wisconsin Entry light or with rafts in tow.	974	2,289,430	.....
Total	2,780	6,168,333	4,058,615

## DEPARTING.

Number which took cargo from Superior and departed through Duluth Canal	580	1,219,970	1,342,270
Number which left Superior light and departed through Duluth Canal	321	375,339	.....
Number which loaded at Superior and departed through Wisconsin Entry	1,244	3,524,239	b 7,257, 136
Number which left Superior light and took cargo on at Duluth and left via canal	346	821,986	.....
Number which departed through Wisconsin Entry light or with booms in tow	268	239,594	.....
Total	2,759	6,181,128	8,599,406

\*These figures do not include 25,750,000 feet B. M. of logs towed in by tugs.

\*These figures do not include 139,125 tons loaded at Duluth.

*Receipts of coal and shipments of flour in 1906.*

[Tons of 2,000 pounds.]

	Duluth.	Superior.	Total.
Coal	1,601,166	3,723,374	5,324,540
Flour	205,096	333,633	538,729

The storage capacity of the Duluth-Superior elevator system is 33,350,000 bushels; that of Duluth elevators is 16,000,000, and of Superior 17,350,000.

The shipments of wheat from Duluth-Superior Harbor for the year were 39,477,971 bushels, or 1,184,339 tons.

The shipments of Canadian grain via Duluth-Superior Harbor in 1906 was about 50,000 bushels, a very small amount compared to the total.

The average net registered tonnage, exclusive of tugs, for Duluth-Superior in 1906 was 2,417—a gain of 251.

*Imports and duties during the calendar year 1906.*

Imports, \$116,744; duties, \$31,238.42; value of domestic exports, \$4,151,702.

*New lines of transportation for 1907.*

J. J. Brown, Buffalo, N. Y., 2 steamers; Duluth and Chicago Transportation Company, 2 steamers; Standard Steamship Company, 1 steamer.

*Additions to existing lines for 1907.*

Acme Steamship Company, 1 steamer; Anchor Line, 1; W. H. Becker, 1; John J. Boland & Co., 1; E. D. Carter, 1; Davidson & Shaw, 1; C. W. Elphicke, 1; Gilchrist Transportation Company, 2; W. A. & H. A. Hawgood, 2; Hutchinson & Co., 1; Mesaba Steamship Company, 2; John Mitchell, 2; Ohio Steamship Company, 1; Pittsburgh Steamship Company, 4; Rutland Transit Company, 2; Shenango Steamship Company, 1; L. C. Smith Transit Company, 2; H. Steinbrenner, 1; Superior Steamship Company, 1; G. A. Tomlinson, 1; Tonawanda Transit Company, 3; Vulcan Steamship Company, 1.

## COMMERCE OF DULUTH-SUPERIOR HARBOR FOR CALENDAR YEAR 1906.

Total vessel freight received and shipped, 29,171,221 tons of 2,000 pounds, valued at \$251,899,844.

Increase in freight tonnage over 1890, 924 per cent.

Increase in freight tonnage during the past year, 28.64 per cent.

It is impossible to give precise figures of the marine commerce of the principal ports of the United States for comparison with Duluth-Superior Harbor, for the reason that at ocean ports of the United States as well as of foreign countries, no record of domestic tonnage is kept at the custom-houses, whereas on the Great Lakes a record is kept of the total marine commerce, both foreign and domestic. In the principal ocean ports of the United States the tonnage of the local and coastwise (domestic) marine commerce is several times greater than that of the foreign.

Any comparison, therefore, of the relative marine commerce of lake and ocean ports, based solely upon custom-house records is, for the reason stated, incorrect and misleading.

The navigation season for Duluth-Superior Harbor averages only about eight months per annum, while for ocean ports navigation is carried on during twelve months. Considering the mean monthly freight movement during the season of navigation, Duluth-Superior Harbor practically stands next to New York.

By an inspection of the accompanying diagram *a* showing the movement of freight by months, it will be seen that during the month of August a less amount of freight was received and shipped than during the preceding or succeeding month, contrary to custom for several years past. This was probably due to the fact that for four days during that month the wreck of the Interstate Bridge prevented the movement of vessels to and from the iron-ore docks, coal and lumber docks, entailing a loss in the movement of freight of probably 300,000 tons.

## REMARKS ON THE COMMERCE OF DULUTH-SUPERIOR HARBOR FOR 1906.

*Vessel tonnage.*—Net registered tonnage is used and is obtained from vessel reports made to this office and checked by official marine directories.

*Valuations.*—Freight valuations were obtained from the various trade journals, commercial records, and the principal wholesale dealers, and are based on average wholesale prices on board vessels for exports and landed on wharves for imports.

*Cargo received.*—5,659,387 tons of cargo were received through the Duluth Canal, and 488,327 tons, not including logs, through the Wisconsin Entry. 25,750,000 feet B. M. of logs came through the Wisconsin Entry, of which amount 25,385,000 feet B. M. came to Duluth.

*Cargo departing.*—15,627,246 tons of cargo departed through the Duluth Canal and 7,396,261 tons through the Wisconsin Entry. Of the latter amount 139,125 tons were loaded at Duluth.

Hard coal shows an increase of 108,974 tons over 1905.

Soft coal shows an increase of 1,608,011 tons over 1905.

Wheat and other grains show an increase of 23,012,249 bushels, with a valuation of \$10,985,718 over 1905.

Iron ore shows an increase of 3,861,061 tons over 1905.

*Wisconsin Entry.*—There was an increase of 965,329 net registered tons and 1,261,878 freight tons over 1905.

The total number of passengers arriving and departing was 96,964, an increase of 15,564 over 1905. A part of the large number of passengers is due to the local excursion business.

Average net registered tonnage recorded at Duluth, exclusive of tugs, 2,384.

Vessels recorded at Duluth Canal were: Entering, 4,443; departing, 4,071; total, 8,514. Net registered tonnage of vessels entering, 10,039,069; departing, 8,812,495; total, entering and departing, 18,851,564.

Average net registered tonnage recorded at Superior, exclusive of tugs, was 2,473.

Vessels recorded at Wisconsin Entry were: Entering, 1,159; departing, 1,512; total, 2,671. Net registered tonnage of vessels entering, 2,542,179; departing, 3,763,833; total, 6,306,012.

Average number of tons cargo received per day at Duluth and Superior, 24,690.

Average number of tons of cargo shipped per day from Duluth and Superior, 92,464.

The navigation season covered a period of 253 days. This is reckoned from the first departure or arrival to the last departure or arrival to or from the lower lakes. The open season for Duluth-Superior Harbor to and from Lake Superior ports only was much longer, as some local boats ran all but one month of the year.

*Duluth Canal.*—First departure for lower lakes, April 13. First boat entered from lower lakes, April 17.

Last boat departed for lower lakes December 14. Last boat arrived from lower lakes December 21.

North shore boats were running at close of calendar year.

*Wisconsin Entry.*—First boat arrived from lower lakes, April 18. First boat departed for lower lakes, April 14.

Last boat arrived from lower lakes December 18. Last boat departed for lower lakes December 12.

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## J J 4.

### IMPROVEMENT OF HARBOR AT PORT WING, WISCONSIN.

For a detailed description of this harbor see the Annual Reports of the Chief of Engineers, United States Army, for the years 1900-1906.

No work has been done at this harbor during the past fiscal year, except the beginning of some repairs a few days before the close of the year, further described in the following paragraphs:

Work was begun by Whitney Brothers June 26, 1907, for closing a breach at the inner end of the west pier of the entrance by a revetment of piles, driftwood, and stone ballast, 100 feet long, and for refilling some partially emptied pockets in the west pier with rock. Estimated cost, \$1,690.

A contract has been let for removing shoals from the entrance channel to the extent of 14,000 yards, more or less, which work is to be done later this season after certain dredging by the same firm for the Government at Ontonagon and Ashland. Estimated contract cost, \$2,485.

An examination of the entrance channel, made April 30, 1907, shows some further shoaling as compared with the condition in April, 1906, but not such as to prevent the passage of the coasting vessels that make use of this harbor at the present time.

On the lake approach, 120 feet out from the piers, is a bar with least depth of 11.5 feet at low water. There is a depth of 13 feet or more for the full width of channel at the outer end of the piers and for 100 feet in from the end. It then narrows up, and for the inner half of the length of the piers a shoal on the west side reaches nearly to midchannel. By running halfway between the middle line and the east pier the least depth for the length of the piers and to 100 feet inside the piers is 13.3 feet. Going farther into the harbor there is less depth, the best water being 11.3 feet to a distance of 350 feet from the piers, which is as far as the examination extended. The river above this is believed to be much shoaler, along the lumber wharf, where logs prevented soundings.

Information has been received from Mr. T. N. Okerstrom, of Port Wing, that he has purchased the large sawmill of Moore, Kepple & Co., which shut down June, 1905, and has resumed sawing this sea-

son. The lumber dock is to be repaired, and the channel alongside has been dredged out.

It is proposed to expend the available balance, together with the appropriation recommended, for repairs to entrance piers, removal of shoals, and for maintenance.

#### *Money statement.*

July 1, 1906, balance unexpended.....	\$3, 528. 61
Amount appropriated by river and harbor act approved March 2, 1907.....	2, 000. 00
	5, 528. 61
June 30, 1907, amount expended during fiscal year, for maintenance of improvement.....	550. 56
July 1, 1907, balance unexpended.....	4, 978. 05
July 1, 1907, amount covered by uncompleted contracts.....	4, 700. 00
{ Amount that can be profitably expended in fiscal year ending June 30, 1909, for maintenance of improvement, in addition to the balance unexpended July 1, 1907.....	5, 000. 00
{ Submitted in compliance with requirements of sundry civil act of June 4, 1897, and of section 7 of the river and harbor act of 1899.	

#### APPROPRIATIONS.

June 13, 1902.....	\$25, 000
March 3, 1905.....	19, 992
March 2, 1907.....	2, 000
Total.....	46, 992

#### EXISTING CONTRACT.

Contract dated May 18, 1907, with Zenith Dredge Company, of Duluth, for dredging shoals at the entrance channel. About 14,000 cubic yards, at 17½ cents per cubic yard. Approved by Chief of Engineers May 29, 1907. Work to begin after completion of dredging at Ashland, Wis., and to be completed by October 10, 1907.

#### COMMERCIAL STATISTICS.

*Arrivals and clearances of vessels at Port Wing, Wis., for the calendar year 1906.*

Vessels.	Arrived.	Cleared.	Total.	Estimated net registered tonnage.
Steam.....	56	56	112	35, 000
Tow.....	2	2	4	2, 000
Tugs.....	100	100	200	5, 000
Total.....	158	158	316	42, 000

Passengers arriving, 386; departing, 382; total, 768.

*Receipts and shipments of freight.*

[Tons of 2,000 pounds.]

Receipts.	Tons.	Shipments.	Tons.
Miscellaneous merchandise.....	100	Miscellaneous merchandise.....	16
		Lumber (1,150,000 feet ash, oak, and pine).....	2,800
		Telegraph poles (135,000).....	16,875
		Cedar posts (45,000).....	1,620
		Railroad ties (82,000).....	2,000
		Piling (8,000).....	600
		Stone (68,000 cubic feet).....	5,100
Total.....	100	Total.....	28,511

Total receipts and shipments, 28,611 tons; decrease, 15,538 tons, equal to 35 per cent.

Total valuation, \$345,448; decrease, \$167,273, equal to 33 per cent.

The above figures do not include scows used for transporting freight or a number of small craft running in for shelter.

## J J 5.

## IMPROVEMENT OF HARBOR AT ASHLAND, WISCONSIN.

For a detailed description of this harbor see recent Annual Reports of the Chief of Engineers and Bulletin No. 16, page 46, of the United States Lake Survey.

The work of strengthening the main breakwater by revetment of riprap, which was commenced in 1903, is now in progress under the contract with George A. Wieland. This contract was to have been completed December 1, 1906, but was extended, with the approval of the Chief of Engineers, for a reasonable period. The expenses of engineering are now being paid by the contractor.

The contractor has stated verbally that he sold out his interest in this contract to the Washburn Stone Company soon after the commencement of work, and has since taken no part in the direction of the work and is only nominally the contracting party. The terms of the deal with the Washburn Stone Company were not disclosed. The contract price is low, the quarry is poor, much of the rock is soft and has had to be wasted or rejected. The company doing the work has seemed to lack capital and energy, was reported to be losing money, and has fallen behind in rate of progress. It had been the intention of this office to require the contractor to deliver the 20 per cent additional to the specified amount of 53,000 tons, as was provided in the contract, but under the circumstances above mentioned it has been decided to close the work with the delivery of 53,000 tons. Work was resumed this season on May 17 under a new management, and the output has been increased.

During the fiscal year ending June 30, 1907, 27,938 tons of rock were delivered under the contract, revetting a distance of 1,215 linear feet. At the rate of delivery so far this season the contract will be completed by the middle of August, 1907. The amount delivered under this contract to June 30, 1907, is 44,490 tons, and the linear distance revetted under this contract to same date is 1,923 feet. The total number of feet of the breakwater now revetted is 3,689 feet, or about one-half of the whole.

It is now probable that the estimate given on page 1714 of the Annual Report for 1906 will not complete the revetment, the reasons being: (a) The reduction in the amount of rock to be delivered at the low price under the present contract, as stated above; (b) more rock is required per linear foot under the present contract, and this is partly due to building the embankment some higher, to allow for settlement, and partly to the quality of the rock, which is softer and has a much larger proportion of spawls (which are allowed under the contract) and which fill into the interstices and increase the weight per unit of volume.

Bids were opened June 6, 1907, for furnishing about 70,000 tons of riprap for continuing the revetment of the breakwater, and the contract awarded to A. Sang, of Duluth, at 99 cents per ton, which was the lowest price for good rock.

No dredging by the Government has been done during the fiscal year. A contract has been entered into for dredging to extend the channel in front of the wharves of the city westward about 1,400 feet and parallel to the harbor line, so that it will reach nearly opposite the Ashland Iron and Steel Company's wharf, this being the farthest wharf to the west now built. Estimated amount of dredging for this extension, 56,000 yards, at a contract cost of \$8,260.

The same contract will include the removal of shoals from the present Government channel in front of the wharves, to an estimated amount of 36,000 yards and contract cost of \$5,310. The price per yard in each case is 14½ cents. This is a low price for that locality and is due to the fact that the dredge was being towed from the Sault to the head of the lake, and could stop and do this and several other jobs on the way without the expense of a special trip. This dredging will be done probably in August and September, 1907.

The dredged material, or as much of it as possible, will be dumped alongside the breakwater to help build up an embankment. It is proposed to expend the sum recommended for further improvement in extending and widening the channel in front of the wharves of the city, and the sum recommended for maintenance in completing the revetment of the breakwater, repairs to same, and the removal of shoals.

#### *Money statement.*

July 1, 1906, balance unexpended.....	\$48, 735. 05
Amount appropriated by river and harbor act approved March 2, 1907.....	90, 000. 00
	<hr/>
	138, 735. 05
June 30, 1907, amount expended during fiscal year, for maintenance of improvement.....	23, 389. 68
	<hr/>
July 1, 1907, balance unexpended.....	115, 345. 37
July 1, 1907, outstanding liabilities.....	3, 101. 78
	<hr/>
July 1, 1907, balance available.....	112, 243. 59
	<hr/>
July 1, 1907, amount covered by uncompleted contracts.....	26, 300. 00
Amount (estimated) required for completion of existing project.....	311, 500. 00
	<hr/>
{ Amount that can be profitably expended in fiscal year ending June 30, 1909, in addition to the balance unexpended July 1, 1907:	
{ For works of improvement.....	
{ For maintenance of improvement.....	
	<hr/>
	47, 000. 00
{ Submitted in compliance with requirements of sundry civil act of June 4, 1897, and of section 7 of the river and harbor act of 1899.	



## APPROPRIATIONS.

August 5, 1886.....	\$22,500	March 3, 1899.....	\$35,000
August 11, 1888.....	60,000	June 13, 1902.....	40,000
September 19, 1890.....	60,000	March 3, 1905.....	60,000
July 13, 1892.....	45,000	March 2, 1907.....	90,000
August 18, 1894.....	25,000		
June 3, 1896.....	27,000	Total.....	484,500

## EXISTING CONTRACTS.

Contract entered into June 15, 1905, with George A. Wieland, Duluth, Minn., for furnishing and placing 53,000 tons (more or less) of riprap alongside and on top the Ashland breakwater, at 79 cents per ton of 2,000 pounds. Contract approved by Chief of Engineers July 3, 1905. Work to commence within one month after notice of approval of contract, and to be completed by December 1, 1906.

Completion time waived for a reasonable period by authority of the Chief of Engineers November 27, 1906. Superintendence and inspection to be charged to the contractor.

Contract entered into June 27, 1907, with Alexander Sang, of Duluth, for furnishing and placing about 70,000 tons of riprap alongside and on top the breakwater, at 99 cents per ton of 2,000 pounds. (Contract not yet forwarded to Chief of Engineers for approval.) Work to commence within one month after approval and to be completed by December 1, 1908.

Contract entered into May 18, 1907, with Zenith Dredge Company, of Duluth, for about 92,000 cubic yards dredging, at 14½ cents. Approved May 29, 1907. Work to commence after the Ontonagon dredging and be completed (including the Port Wing dredging) by October 10, 1907.

## COMMERCIAL STATISTICS.

*Arrivals and clearances of vessels at Chequamegon Bay, Wisconsin (Ashland, Washburn, and Bayfield), for the calendar year 1906.*

Vessels.	Arrived.	Cleared.	Total.	Estimated net registered tonnage.
Domestic.....	990	991	1,981	3,822,581
Foreign.....	60	61	121	146,268
Total.....	1,050	1,052	2,102	3,968,799

Decrease in vessels, 96; increase in net registered tonnage, 41,017. Average tonnage, 1888.

Passengers arriving, 456; departing, 269; total, 725.

*Receipts and shipments of freight.*

[Tons of 2,000 pounds.]

Receipts.	Tons.	Shipments.	Tons.
Miscellaneous merchandise.....	5,845	Miscellaneous merchandise.....	68
Fish.....	721	Iron ore.....	3,738,684
Coal, hard.....	24,107	Fish.....	2,906
Coal, soft.....	740,061	Lumber (129,046,180 feet).....	193,570
Iron pyrites.....	1,899	Lath (4,430,000 pieces).....	1,108
Salt (41,420 barrels).....	5,917	Shingles (447,000).....	45
		Grain (5,049,900 bushels).....	151,497
		Pig iron.....	18,046
		Stone.....	28,067
Total.....	778,040	Total.....	4,131,991

# 1850 REPORT OF THE CHIEF OF ENGINEERS, U. S. ARMY.

Total receipts and shipments, 4,010,031 tons; decrease, 6,143 tons.

Total valuation, \$20,793,478; decrease, \$153,036; less than 1 per cent.

In addition, there were 36,000,000 feet B. M. of logs towed in, valued at \$540,000.

NOTE.—The local ferry business between Ashland, Washburn, and Bayfield amounted to 4,143 trips, carrying 43,123 passengers and 100 tons of freight. There is also quite an extensive excursion business between the above towns and the Apostle Islands, also of tugs, of which no record is kept.

*Arrivals and clearances of vessels at Bayfield, Wis., for the calendar year 1906.*

[These figures are included in those for Chequamegon Bay.]

Vessels arrived, 109; departed, 111; total, 220. Estimated tonnage, 85,520.

Passengers arriving, 456; departing, 269; total, 725.

## *Freight received and shipped.*

[Tons of 2,000 pounds.]

Received.	Tons.	Shipped.	Tons.
Miscellaneous merchandise.....	245	Lumber (20,133,160 feet).....	30,200
Salt (2,220 barrels).....	317	Lath (4,430,000).....	1,108
Fish.....	721	Shingles (447,000).....	45
		Fish.....	1,551
		Miscellaneous merchandise.....	68
Total.....	1,283	Total.....	32,972

Total receipts and shipments, 34,255 tons.

Total valuation, \$645,630.

## J J 6.

### IMPROVEMENT OF HARBOR AT ONTONAGON, MICHIGAN.

For further details see previous Annual Reports of the Chief of Engineers, United States Army, particularly the one for 1896.

A survey of the harbor and of the river up to a distance of about five-eighths of a mile above the bridge was made in June, 1903, under directions of this office, by H. H. Wadsworth, assistant engineer. A reduced copy of the resulting map accompanies the report for 1903.

The project for the improvement of this harbor was completed in 1889. Dredging to the extent of 22,936 cubic yards was done in 1891, and a channel depth of 16 feet was reported as a result, but maps show the channel as narrow. No dredging was done from 1891 to 1894, but the channel had shoaled from a general depth of 12 to 16 feet to a general depth of about 12 feet. In 1894 the amount of dredging was 33,817 yards, and the entrance channel remained without dredging until 1903, a period of nine years, when 18,054 cubic yards were dredged. This channel kept open during 1904, but in the spring of 1905 the channel shoaled suddenly to a least depth of less than 8 feet between piers and less than 6 feet in the lake in front.

In addition to available funds, \$5,000 were allotted May 13, 1905, from the emergencies in rivers and harbors, and a channel was dredged 120 feet wide and 15 feet deep through the bar outside, 60 feet or more wide and 14 feet deep between the piers, and 75 feet wide and 12 feet deep along the harbor to the lumber dock.

On the breaking up of the ice in 1906 there was reported a least depth on a line of soundings through the channel cut in 1905 of 11 feet and a general depth of 14 feet. Heavy rains and melting snows caused floods in the river, and the next report was that there was a least depth of 9 feet. A survey was hurriedly made, and showed that by taking a tortuous route a vessel could find 10.3 feet to the commercial dock and 9.3 to the lumber dock. On May 10, 1906, \$5,000 were allotted from the emergencies in rivers and harbors, and contract made for dredging at 20 cents per cubic yard, and 23,937 cubic yards were dredged, giving a channel 60 feet wide between the piers with a depth of 14 feet, and narrower channels to the docks with a depth of 13 to 14 feet.

On May 6, 1907, bids were opened and a contract entered into on May 18, 1906, with the Zenith Dredge Company for about \$4,000 worth of dredging at 17½ cents per yard, a very cheap figure. On May 11 a series of soundings was taken between the piers, and a few days later it was found that high water in the river, caused by rains, had shoaled the channel so that soundings were taken a second time on May 16. These soundings showed a shoaling during the interval of five days of 3.5 feet and less.

Further shoaling developed in June, so that the then available funds would have been insufficient to make even a single dredge cut from the lake to the wharves. To relieve the situation, an allotment of \$10,000 from the emergency appropriation act of March 2, 1907, was granted on June 22, and a supplemental contract was then entered into with the Zenith Dredge Company for increasing the dredging to a total amount of 62,000 cubic yards, more or less. Dredging under contract was begun June 15, 1907, and is now in progress. A single cut has thus far been made from the lake up to about the north end of the lumber dock on the west side of the harbor. In addition, considerable private dredging will be done.

The Ontonagon River brings down in flood large quantities of material, and when this reaches the harbor it is quickly deposited, the flow from the river being insufficient to keep the cross section between the piers clear. An extension of the piers to deeper water would improve the situation some, but would not eradicate the evil. It is believed that the best results can be obtained by making a sufficient appropriation at one time to thoroughly dredge the area between the piers and up to the two docks, and then provide a sum for maintenance sufficient to dredge out the results of at least two bad floods and keep this on hand until a bad season should occur. The dredging should be generally to a depth of 16 feet, in order to insure the project depth of 12 feet.

In addition to the needs for dredging, as mentioned above, the west pier is in bad shape at its outer end and will undoubtedly call for some repairs in the next two years.

The needs of this harbor in the next river and harbor appropriation will be for maintenance \$30,000, to be expended in dredging the entrance and harbor and repairing the piers.

The shipments of lumber from this harbor are rapidly increasing. In 1904 about 8,000,000 feet were shipped. In 1906 about 14,000,000, and it is estimated that 25,000,000 will be shipped during this season.

*Money statement.*

July 1, 1906, balance unexpended.....	\$102. 40
Amount appropriated by river and harbor act approved March 2, 1907.....	5, 000. 00
Amount allotted from emergencies in river and harbor works, act March 2, 1907.....	10, 000. 00
	<hr/> 15, 102. 40
June 30, 1907, amount expended during fiscal year, for maintenance of improvement.....	499. 92
	<hr/> 14, 602. 48
July 1, 1907, balance unexpended.....	12, 500. 00
July 1, 1907, amount covered by uncompleted contracts.....	<hr/> 12, 500. 00
{ Amount that can be profitably expended in fiscal year ending June 30, 1909, for maintenance of improvement, in addition to the balance unexpended July 1, 1907.....	30, 000. 00
{ Submitted in compliance with requirements of sundry civil act of June 4, 1897, and of section 7 of the river and harbor act of 1899.	

## APPROPRIATIONS.

March 2, 1867.....	\$97, 000	September 19, 1890.....	\$10, 000
July 7, 1870.....	10, 000	July 13, 1892.....	20, 000
June 23, 1874.....	23, 000	August 7, 1894.....	7, 000
March 3, 1875.....	25, 000	June 3, 1896.....	10, 000
August 14, 1876.....	15, 000	Received on account of dam- age to piers.....	28
June 18, 1878.....	15, 000	June 13, 1902.....	5, 000
March 3, 1879.....	17, 000	March 3, 1905.....	3, 000
June 14, 1880.....	15, 000	March 3, 1905 (allotments)...	10, 000
March 3, 1881.....	20, 000	March 2, 1907.....	5, 000
August 2, 1882.....	20, 000	March 2, 1907 (allotments)...	10, 000
July 5, 1884.....	15, 000		
August 5, 1886.....	13, 000		
August 11, 1888.....	12, 500	Total.....	378, 128

## EXISTING CONTRACT.

Contract dated May 18, 1907, with Zenith Dredge Company, of Duluth, Minn., for dredging to remove shoals at entrance and between the piers. About 21,000 yards to be removed at 17½ cents, approved May 29, 1907. Work to begin June 10 and completed (including Ashland and Port Wing dredging) October 10, 1907. Supplemental contract dated June 27, 1907, increasing the amount to be dredged to 62,000 yards, more or less, forwarded to Washington for approval.

## COMMERCIAL STATISTICS.

*Arrivals and clearances of vessels at Ontonagon, Mich., for the calendar year 1906.*

Vessels.	Arrived.	Cleared.	Total.	Estimated net regis- tered ton- nage.
Steam.....	191	191	382	122, 250
Tow.....	4	4	8	3, 000
Total.....	195	195	390	125, 250

Increase over 1905 in vessels, 30; decrease in tonnage, 64,750

*Receipts and shipments of freight.*

[Tons of 2,000 pounds.]

Receipts.	Tons.	Shipments.	Tons.
Miscellaneous merchandise.....	2,710	Miscellaneous merchandise.....	801
Fish.....	363	Lumber (11,682,405 feet).....	17,449
		Lath (1,932,000).....	483
		Shingles (250,000).....	25
		Farm products.....	80
Total.....	3,073	Total.....	18,838

Total receipts and shipments, 21,411 tons; decrease, 9,095 tons, equal to 29.8 per cent.

Total valuation, \$797,047; decrease, \$246,134, equal to 23.6 per cent.

In addition there were 1,850,000 feet of logs received and 6,800,000 feet shipped; total, 8,650,000 feet, valued at \$129,750.

Increase in logs, 625,000 feet, equal to 7.8 per cent.

Increase in value of logs, \$25,425, equal to 24½ per cent.

## J J 7.

## IMPROVEMENT AND OPERATING AND CARE OF WATERWAY FROM KEWEENAW BAY TO LAKE SUPERIOR, MICHIGAN.

For the history of this waterway and its purchase by the United States, see Report of the Chief of Engineers for 1892, Appendix II, page 2158. For the work of improvement by the United States, see subsequent annual reports. A complete detailed description of this waterway is also given in Bulletin No. 17, published by the Survey of Northern and Northwestern Lakes, April, 1907, pages 66 to 71. See, also, the new chart, in colors, issued March 15, 1905, by the Survey of Northern and Northwestern Lakes.

The approved project for improvement is not fully completed, although nearly so, and the river and harbor act of March 3, 1905, appropriated \$45,000 for "continuing improvement."

No work of improvement was carried on during the past year.

In October, 1906, the U. S. tug *Circle* was purchased for use on this waterway, by the transfer of \$1,500 from the funds for improving waterway to the Duluth-Superior appropriation. A derrick scow was also built during the spring at Superior Entry for use at Portage Lake canals, and the cost, \$3,300, charged to the appropriation for improving waterway. The tug and scow are both in commission now, and will be of material aid in making repairs to breakwaters, piers, and revetments.

The large commerce carried through the Portage Lake canals is evidence of the importance of this waterway and of the benefits derived from its improvement.

The needs of further improvements to this waterway have begun to receive consideration.

In my predecessor's special report to you, under date of December 29, 1903, was set forth the need of a harbor of refuge at the lower end of this waterway, just inside the mouth of Portage River, similar to the harbor of refuge near the upper end, known as Lily Pond. Plans

for such a harbor accompanied the report, and an estimate of its cost, which was \$150,000. The river and harbor act approved March 2, 1907, makes provision for a preliminary examination of "Keweenaw Canal with a view to the construction of a harbor of refuge at its eastern entrance." The report called for will be submitted at an early date.

Another possible improvement that would be of value is to straighten the channel of Portage River by cutting off Princess Point, with its sharp bend—a bend that is causing some inconvenience to the larger class of vessels, especially passenger boats that now use this waterway. The condition at this point has been very much improved by the work done during the fiscal year ending June 30, 1905, but it will always present some difficulties to the navigator unless straightened.

The remaining balance of the appropriation (\$14,889.82) was intended for the renewal of some of the old revetments, which were in poor shape when the canal was purchased by the United States. Every cut was revetted with a timber-and-pile revetment to prevent wash of the banks. In many cases the cuts were through clay and in swamps, and it is not believed that much wash will occur, especially as the portion of the revetment below water will not decay. For this reason it has been decided not to renew useless woodwork, which will again decay, and the revetments in some places will be allowed to remain as they are until the necessity for their renewal shall be demonstrated.

#### OPERATING AND CARE.

*Location.*—The Portage Lake ship canals constitute the waterway across Keweenaw Point, in the State of Michigan, from Keweenaw Bay to Lake Superior, there being about 25 miles of water route, consisting of 5½ miles of Portage River with its four cuts, 17 miles of Portage Lake, and 2¼ miles in the upper canal from the head of Portage Lake to Lake Superior.

Under authority of the river and harbor act of September 19, 1890, the Secretary of War allotted \$11,500 for operating and care of canals and other works of navigation to be applied to Portage Lake and Lake Superior canals, Michigan, for the fiscal year ending June 30, 1907.

The approved project for the expenditure of this allotment is to maintain the depth and width obtained by the work of improvement; to keep a record of the vessels and their tonnage using the canals; to exercise the necessary care in enforcing regulations for the use of the canals; to make frequent surveys to determine changes and to check up work done in dredging; to guard against encroachments on the legally established harbor lines; and to perform other work incident to the operation and care of the canals. The amount allotted has been expended in carrying out the above programme of duties, except \$2,250 which were reported and deducted from the estimate made for next year.

As no shoaling of the channels was found to have occurred during the past fiscal year, no dredging was done, and the \$2,000 available for this purpose was not expended. Dredging by private parties was done along the front of the Tamarack coal dock, on the east side of the Isle Royale coal dock, and just west of the Houghton-Hancock bridge, back of the harbor line. The depth of water obtained at these

places was about 20 feet low-water datum, and the material was dumped well out of the way of the channels under the supervision of Junior Engineer George H. Banks. The severe storms of last fall and winter caused considerable scouring around the L's of both breakwaters at the upper canal, and in consequence a large amount of rock filling escaped from several of the pockets of the cribs and was carried away from the berm at the base of the cribs on the lake side. The refilling of these pockets by placing large blocks of sandstone in the bottom and completely filling with rubble, and also placing large blocks of riprap on the berm at the base of the cribs on the lake side, is now going on. The work is being done by the Government, using the tug crew, watchmen, and hired labor to handle the rock, which is towed by the U. S. tug *Circle* from the Jacobsville quarry on the new derrick scow. An agreement was entered into on June 15, 1907, with J. W. Wyckoff, to furnish 300 cords of sandstone, more or less. The severe storm of October 8-10, 1906, raised the deck planks attached to longitudinals for a distance of 64 feet along the east breakwater, the greatest height being about 8 inches at the center. This was repaired by the tug crew and hired labor.

During the past fiscal year six breaks were made in the revetments by vessels colliding with them. Four of these breaks were at the upper canal above Lily Pond, one south of Lily Pond, and one in Cut 3, Portage river. Three of the breaks at the upper canal are not of a serious nature, and have not been repaired. Two of the breaks above Lily Pond were repaired at a cost of \$399.50, the bills being paid by the vessel owners. The damage to Cut 3 revetment in Portage River has not yet been repaired. When completed the cost will be paid by the owners of the vessel which did the damage. It has been customary where the damage is material and plainly due to carelessness to call on owners of vessels to pay for repairs, and during the year the cost of all necessary revetment repairs has been paid by vessel owners. This is done by agreement made by this office with the lowest bidder, with the understanding that payment will be made by check direct from the vessel owner to the contractor.

The U. S. tug *Circle*, which was transferred from Duluth-Superior Harbor to Keweenaw Canal, was rebuilt during the spring at Houghton, the work being done by hired labor, at a total cost for labor and material of \$1,610.

Minor surveys were made from time to time as necessary. During the winter a map was made of Portage River on a scale of 400 feet to 1 inch, showing the channel, stage of water, etc., to date.

A record of the water level has been continued three times a day at three points: At Houghton, at the watchman's house at the upper canal, and at the watchman's house on Portage River.

Two watchmen have been employed, one at the upper canal and one at Portage River. Each has kept a record of all passing vessels and rafts, reported damages to piers and revetments from collisions, violations of rules and regulations, and read a water gauge. The watchman at upper canal also kept a record of three wave dynamometers located on the breakwater piers.

New rules and regulations for the Portage Lake Ship Canals across Keweenaw Point, Michigan, were approved by the Secretary of War April 13, 1907, and went into effect May 1, 1907.

# 1856 REPORT OF THE CHIEF OF ENGINEERS, U. S. ARMY.

In addition to the \$2,250 left over from last year's allotment \$11,750 have been allotted for the year ending June 30, 1908, making \$14,000.

During the past year the local charge of the Portage Lake canals has been in the hands of George H. Banks, junior engineer.

## Money statement.

July 1, 1906, balance unexpended.....	\$21,009.30
June 30, 1907, amount expended during fiscal year, for maintenance of improvement.....	6,119.48
July 1, 1907, balance unexpended.....	14,889.82

## APPROPRIATIONS.

September 19, 1890:

For the purchase of Portage Canals.....	\$350,000.00
For maintenance to June 30, 1892.....	10,000.00
For harbor lines, Portage Lake.....	5,128.70

Total..... 365,128.70

The above amounts were expended for the purposes for which appropriated.

## FOR IMPROVING WATERWAY FROM KEWEENAW BAY TO LAKE SUPERIOR, MICHIGAN.

July 13, 1892.....	\$50,000.00	March 3, 1901.....	\$145,000.00
August 18, 1894.....	130,000.00	June 28, 1902.....	10,000.00
June 3, 1896.....	50,000.00	March 3, 1905.....	45,000.00
June 4, 1897.....	350,000.00	Miscellaneous.....	237.68
July 1, 1898.....	450,000.00		
June 6, 1900.....	110,000.00	Total.....	1,340,237.68

The following statement shows the manner in which the appropriations have been expended. The amount expended under the different classes of work includes the cost of examinations, soundings, superintendence, buoing, and contingencies.

Dredging.....	\$528,426.83
Pier work, revetment, etc.....	782,715.03
Purchase of land.....	9,406.00
Tug and scow, etc.....	4,800.00
Total.....	1,325,347.86

*Allotments for operating and care of Portage Lake and Lake Superior canals, Michigan, from the permanent indefinite appropriation of act of July 5, 1884, for operating and care of canals, etc.*

July 1, 1892.....	\$31,028	July 1, 1901.....	\$8,500
July 1, 1893.....	11,647	July 1, 1902.....	9,000
July 1, 1894.....	8,000	July 1, 1903.....	15,500
July 1, 1895.....	11,500	July 1, 1904.....	15,000
July 1, 1896.....	8,300	July 1, 1905.....	8,500
July 1, 1897.....	8,300	July 1, 1906.....	9,250
July 1, 1898.....	8,300	July 1, 1907.....	14,000
July 1, 1899.....	8,300		
July 1, 1900.....	8,300	Total.....	183,425

All the amounts were expended in maintaining the canals except \$117.36 of the 1892 allotment, which amount reverted to the treasury. The \$14,000 allotted July 1, 1907, will be expended during the fiscal year ending June 30, 1908.



*Summary of expenditures made from appropriation for operating and care of canals and other works of navigation (indefinite), act of July 5, 1884, applied to Portage Lake and Lake Superior canals, Michigan, during fiscal year 1907.*

Date.	Office ex- pense.	Field service.	Pier and revet- ment re- pairs.	Miscella- neous.	Total.
1906.					
July .....	\$159.10	\$452.00			\$611.10
August .....	95.00	517.00			612.00
September .....	102.00	485.80	\$77.78		665.58
October .....	90.00	471.00	210.62	\$32.03	803.65
November .....	225.00	326.06		10.49	561.55
December .....	225.00	219.74	37.34	98.32	578.40
1907.					
January .....	237.00	142.00		5.00	384.00
February .....	239.40	142.00		55.27	436.67
March .....	210.50	146.00		5.00	361.50
April .....	227.48	287.86		52.33	567.67
May .....	125.00	333.34		545.81	1,004.15
June .....	133.33	700.37	590.76	1,209.27	2,633.73
Total .....	2,098.81	4,223.17	916.50	2,011.62	9,250.00

## COMMERCIAL STATISTICS.

*Number of vessels and net registered tonnage for the calendar year 1906.*

Month.	Steam vessels, except tugs.		Tow barges		Tugs.		Total vessels.		Scows.
	No.	Tonnage.	No.	Tonnage.	No.	Tonnage.	No.	Tonnage.	
Upbound:									
April .....	45	56,556	28	18,243	19	972	92	75,771	7
May .....	93	106,081	27	20,250	66	2,501	186	128,832	55
June .....	167	148,267	47	34,421	75	4,766	289	187,454	48
July .....	219	173,649	41	31,819	86	3,698	346	209,166	57
August .....	194	195,454	11	30,612	64	2,699	299	228,765	47
September .....	151	194,106	65	46,807	78	3,344	294	244,257	46
October .....	160	222,207	74	61,706	46	1,776	280	285,689	30
November .....	145	218,122	42	34,338	42	1,543	229	254,008	24
December .....	9	15,549			16	672	25	16,221	1
Downbound:									
April .....	16	18,124	2	2,724	16	610	34	21,458	6
May .....	69	55,159	38	24,869	68	2,830	175	82,558	44
June .....	115	58,055	17	12,372	73	4,540	205	74,967	42
July .....	162	87,322	12	14,353	82	3,525	256	105,200	50
August .....	140	77,924	20	16,467	62	2,671	222	97,052	37
September .....	108	113,490	42	29,378	79	3,315	229	146,183	44
October .....	98	88,152	55	41,082	51	2,135	204	131,319	39
November .....	90	100,613	36	26,624	35	1,284	159	128,621	18
December .....	23	32,748	4	3,218	16	732	43	36,698	.....
Total up and down.	2,004	1,961,578	591	449,223	972	43,613	3,567	2,454,414	596

*Statement of marine commerce through the Portage Lake Ship Canals.*

## UPBOUND.

	Tons.		Tons.
Cement (50,700 barrels) .....	10,140	Machinery .....	488
Coal:		Lumber (13,544 M feet) .....	23,702
Hard .....	98,396	Oil (32,555 barrels) .....	6,511
Soft .....	1,118,403	Salt (175,835 barrels) .....	25,122
Copper .....	11,143	Sand .....	5,022
General merchandise .....	196,581	Stone, building .....	14,936
Iron manufactured .....	96,322	Ties, railroad (10,651) .....	592
Iron ore .....	5,600	Unclassified .....	7,828
Lath (810,000) .....	202		
Limestone .....	24,036	Total .....	1,645,022

# 1858 REPORT OF THE CHIEF OF ENGINEERS, U. S. ARMY.

## DOWNBOUND.

	Tons.		Tons.
Coal:		Stamp sand.....	12, 390
Hard.....	7, 727	Shingles (45,420,000).....	4, 542
Soft.....	27, 797	Ties, railroad (39,739).....	2, 208
Copper.....	85, 124	Wheat (1,998,502 bushels).....	59, 955
Flaxseed (311,000 bushels).....	8, 708	Unclassified.....	1, 156
Flour (1,280,098 barrels).....	128, 009		
Grains, except flax and wheat (1,292,205 bushels).....	32, 305	Total.....	987, 333
General merchandise.....	19, 561		
Iron ore.....	192, 097	Total up and down (tons of	
Iron manufactured.....	2, 269	' 2,000 pounds).....	2, 632, 355
Lath (360,000).....	90		
Stone, building.....	559	Passengers upbound.....	36, 909
Machinery.....	210	Passengers downbound.....	35, 491
Lumber (235,872,000 feet).....	393, 031		
Oil (2,335 barrels).....	467	Total.....	72, 400
Pig iron.....	9, 128		

*Value of freight carried through Portage Lake ship canals during the calendar year 1906.*

Description of cargo.	Quantity.	Unit price.	Valuation.
Cement.....barrels..	50, 700	\$2. 00	\$101, 400
Coal:			
Hard.....tons..	106, 123	6. 25	663, 269
Soft.....do.....	1, 146, 200	3. 65	4, 183, 630
Copper.....do.....	96, 267	400. 00	38, 506, 800
Flaxseed.....bushels..	311, 000	1. 16	360, 760
Flour.....barrels..	1, 280, 098	3. 85	4, 928, 343
Grains (except flax and wheat).....bushels..	1, 292, 205	. 42	542, 726
General merchandise.....tons..	216, 142	175. 00	37, 824, 850
Iron (manufactured).....do.....	98, 591	78. 00	7, 690, 098
Iron ore.....do.....	197, 697	2. 65	523, 897
Lath.....M.....	1, 170	3. 75	4, 388
Limestone.....tons..	24, 036	1. 50	36, 054
Lumber.....M feet B. M..	249, 416	19. 35	4, 826, 200
Oil.....barrels..	34, 890	6. 75	235, 507
Pig iron.....tons..	9, 128	21. 50	196, 252
Salt.....barrels..	175, 855	. 75	131, 891
Sand.....cubic yards..	13, 059	. 70	9, 141
Shingles.....M.....	45, 420	3. 00	136, 260
Stone, building.....tons..	15, 495	5. 60	86, 772
Ties, railroad.....number..	50, 390	. 52	26, 203
Wheat.....bushels..	1, 998, 502	. 76	1, 518, 862
Unclassified.....tons..	8, 962		51, 726
Machinery.....do.....	698	875. 00	261, 750
Total valuation.....			102, 846, 779

In addition to the above, 5,603,000 feet B. M. of logs, valued at \$84,045, were towed through the canals.

In the above table the local traffic, amounting in value to about \$1,000,000, is not recorded; that is, vessels trading between points on Portage and Torch Lake, transporting lumber, cord wood, hay, charcoal, castings, and towing rafts of logs and timber.

*Openings and closings of navigation in Portage Lake ship canals, Michigan, while in charge of the United States, 1891 to 1906, inclusive.*

Date of opening.	Steamer.	Date of closing.	Steamer.
April 26, 1892 .....	Nipigon.	November 30, 1891 ...	A. L. Hopkins.
May 9, 1893 .....	Jos. L. Hurd.	November 30, 1892 ...	S. F. Hodge.
April 22, 1894 .....	Japan.	November 23, 1893 ...	J. H. Shrigley.
April 25, 1895 .....	Annie R. Hennes.	November 30, 1894 ...	Jay Gould.
April 24, 1896 .....	City of Duluth.	December 2, 1895 ...	Matos.
April 23, 1897 .....	Peerless.	November 26, 1896 ...	Cumberland.
April 17, 1898 .....	Iroquois.	December 2, 1897 ...	Japan.
May 1, 1899 .....	R. G. Stewart.	December 4, 1898 ...	Martin Swain (tug).
April 19, 1900 .....	Bon Voyage.	December 15, 1899 ...	Cora A. Sheldon, with whaleback No. 137.
April 23, 1901 .....	Mabel Bradshaw.		
April 4, 1902 .....	Bon Ami.	December 8, 1900 ...	Cuba.
April 15, 1903 .....	W. H. Gratwick.	December 5, 1901 ...	Clyde, with Amboy.
April 30, 1904 .....	Tug Valerie.	December 13, 1902 ...	Grover.
April 12, 1905 .....	Schuykill.	December 9, 1903 ...	Hutchinson.
April 18, 1906 .....	Phillip Minch.	December 6, 1904 ...	North Star.
May 7, 1907 .....	—	December 11, 1905 ...	Eber Ward.
		December 10, 1906 ...	—

## EXPLANATORY NOTES AND GENERAL INFORMATION.

The following records are for vessels passing through Portage Lake Ship canals, Michigan, also for vessels entering the canals from either direction and discharging or loading at a port within the waterway.

Local traffic is not recorded—that is, vessels trading between points on Portage Lake and Torch Lake.

The ton, as used in all these tables, is 2,000 pounds.

Unit values for items of freight, and factors for converting various units of measurement into tons, are the same as used in the compilation of Duluth-Superior commerce for 1906, with but few exceptions.

Attention is invited to the within diagram *a* showing how the cargo sizes are gradually increasing. The new drawbridge between Houghton and Hancock has given very good service during the season, and there has been more of the larger class of vessels through this waterway than ever before.

Loaded vessels 500 feet and over in length, drawing 19 feet 5 inches, have passed through these canals during the past season without difficulty.

The commerce on Lake Superior is heaviest during July and August, yet it will be noted that there is more freight going through this waterway in October and November, or in the stormy season, than at any other time, which shows clearly the extent to which these canals are used for refuge.

The average net registered tonnage of the largest 20 vessels passing through is 4,025 tons.

The navigation season covers a period of two hundred and thirty-seven days, extending from the opening on April 18 to the closing on December 10.

The earliest opening of these canals was April 4, 1902; the latest opening, May 9, 1893; the average, April 22. The earliest closing, November 26, 1896; latest closing, December 15, 1890; average, December 5.

## REMARKS ON THE COMMERCE THROUGH THE CANALS.

Logs to the amount of 5,603,000 feet B. M., valued at \$84,045, were towed through the canals, made up into 27 rafts—19 down and 8 upbound.

There were also 57 sets of booms taken through the waterway, which are not included in this statement.

Total vessel freight up and down, 2,632,355 tons, valued at \$102,846,779.

Increase in freight tonnage over 1896, 218 per cent.

Increase in freight tonnage during past year, 9.07 per cent.

Cement cargoes show a decrease of 12,950 barrels.

Hard-coal cargoes show a decrease of 56,749 tons.

Soft-coal cargoes show an increase of 120,206 tons.

Copper cargoes show an increase of 734 tons.

Wheat and other grains show an increase of 509,552 bushels, valued at \$364,106.

General merchandise shows an increase of 39,486 tons, valued at \$6,901,300.

Manufactured iron shows an increase of 41,756 tons, valued at \$3,256,968.

Lumber shows an increase of 5,648,000 feet B. M., valued at \$109,289.

Iron ore shows a decrease of 584 tons, valued at \$1,548.

Flour shows an increase of 560,760 barrels, valued at \$2,158,926.

These statistics have been compiled in the local office in Houghton, Mich., from vessels' reports made in compliance with the act of Congress approved February 21, 1891.

## J J 8.

### IMPROVEMENT OF HARBOR AT MARQUETTE, MICHIGAN.

For a history of this harbor, see Annual Reports of the Chief of Engineers for previous years.

For detailed description of this concrete work, with drawings, photographic views, cost, etc., see the Annual Reports, for 1896, pages 2365 to 2385; 1897, pages 2615 to 2638, and 1898, pages 2252 to 2282. The Annual Report for 1904, pages 2775 and 2776, gives a description and cross section of the latest portion of the work, which includes certain modifications in the method of construction found advisable by experience during the earlier progress.

The concrete superstructure is now built to a total length of 2,920 feet, which is 97 per cent of the entire length, and has been connected with the shore at the northerly end by building a protection wall 100 feet long. The concrete work stops 100 feet short of the end of the old breakwater. To complete the existing project it would only be necessary to build a pierhead and connect it with the finished work. This would cost \$20,000, and the funds are now available should Congress decide not to extend the breakwater.

Attention is invited to report from this office of September 30, 1903, printed in House Executive Document No. 161, Fifty-eighth Congress, second session, and also printed in the Annual Report of the Chief of Engineers for 1904, Appendix II, page 2786, recommending a further extension of this breakwater, in which the division engineer, the Board of Engineers for Rivers and Harbors, and the Chief of Engineers, United States Army, concurred. If provision be made by Congress for this extension no pierhead will be required at the present end of the breakwater, and the present form of concrete superstructure could be continued over the gap of 100 feet previously mentioned at a cost of \$6,000 from the funds held in reserve for improvement.

The repair work going on at the time of the last annual report was completed early in August, 1906, at a total cost of \$1,420.96. Some further repairs to the breakwater were made in May, 1907, at a total cost of \$652.87.

The work in both cases was done by hired labor and the purchase of material in the open market, or under public notice. Mr. James O. Movick, inspector, was in immediate charge of the work, and was under the direction of an assistant engineer in this office.

*Money statement.*

July 1, 1906, balance unexpended	\$3, 521. 62
Amount appropriated by river and harbor act approved March 2, 1907	30, 000. 00
	33, 521. 62
June 30, 1907, amount expended during fiscal year, for maintenance of improvement	3, 807. 39
July 1, 1907, balance unexpended	29, 714. 23
<hr/>	
{ Amount that can be profitably expended in fiscal year ending June 30, 1909, for maintenance of improvement. In addition to the balance unexpended July 1, 1907	10, 000. 00
{ Submitted in compliance with requirements of sundry civil act of June 4, 1897, and of section 7 of the river and harbor act of 1899.	

## APPROPRIATIONS.

March 2, 1867 (allotment)	\$85, 000. 00	August 11, 1888	\$25, 000. 00
April 10, 1869 (allotment)	26, 730. 00	September 19, 1890	40, 000. 00
July 11, 1870	25, 000. 00	July 13, 1892	80, 000. 00
March 3, 1871	60, 000. 00	August 18, 1894	30, 000. 00
June 10, 1872	50, 000. 00	June 3, 1896	29, 000. 00
March 3, 1873	15, 000. 00	March 3, 1899	25, 000. 00
June 23, 1874	15, 000. 00	June 13, 1902	26, 000. 00
March 3, 1875	15, 000. 00	March 3, 1903, sundry civil act	80, 000. 00
June 18, 1878	2, 000. 00	March 3, 1905	3, 000. 00
August 14, 1878	2, 000. 00	March 2, 1907	30, 000. 00
March 3, 1879	1, 500. 00	Miscellaneous receipts	358. 69
June 14, 1880	1, 000. 00		
August 2, 1882	16, 000. 00		
July 5, 1884	5, 000. 00		
August 5, 1886	10, 000. 00	Total	697, 588. 69

## COMMERCIAL STATISTICS.

*Arrivals and clearances of vessels at Marquette, Mich. (including Presque Isle, Mich.), for the calendar year 1906.*

Vessels.	Arrived.	Cleared.	Total.	Estimated net registered tonnage.	Average.
Steam	859	840	1, 699	3, 459, 728	2, 036
Tow	94	91	185	218, 264	1, 180
Total	953	931	1, 884	3, 677, 992	1, 962
Decrease	106	113	218	166, 970	.....
Increase					122

Decrease in vessels equal to 10 per cent; tonnage, over 4 per cent.

# 1862 REPORT OF THE CHIEF OF ENGINEERS, U. S. ARMY.

## *Receipts and shipments of freight for Marquette (including Presque Isle).*

[Tons of 2,000 pounds.]

Receipts.	Tons.	Shipments.	Tons.
Coal, hard and soft.....	256,442	Iron ore.....	2,764,083
Brick (100,000).....	250	Pig iron.....	4,788
Salt (3,800 barrels).....	471	Lumber (6,445,000 feet).....	8,166
Oil (950 barrels).....	190	Ties, railroad, (14,000).....	983
Miscellaneous merchandise.....	17,260		
Rails and angle bars.....	2,589		
Total.....	277,092	Total.....	2,777,922

Total freight, 3,055,014 tons; decrease, 636,522 tons; equal to 17 per cent.

Total valuation, \$11,795,985; decrease, \$2,275,047; equal to 16 per cent.

These figures do not include the numerous vessels which ran into the harbor for shelter or tugs engaged in the fish trade.

## J J 9.

### HARBOR OF REFUGE, MARQUETTE BAY, MICHIGAN.

This harbor is also known as Presque Isle Harbor.

For the description of the locality and the interests to be benefited by the improvement, see Annual Report of the Chief of Engineers, United States Army, 1896, pages 2385, 2386.

For the work of improvement, see the Annual Reports of the Chief of Engineers, United States Army, for years 1897, 1901, and 1903. See also the current summary.

The approved projects were for building 1,000 feet of breakwater running out from Presque Isle Point (completed in 1900), and afterwards for closing a gap between said breakwater and the shore by cribwork 216 feet long (completed in 1902).

The work, which affords great protection to the commercial business done in this bay, was, when last visited, in fairly good condition, though the breakwater is now liable to need repairing at any time after a severe storm.

The available balance, together with the appropriation recommended, it is proposed to expend for maintenance.

### *Money statement.*

July 1, 1906, balance unexpended.....	\$943. 66
June 30, 1907, amount expended during fiscal year, for maintenance of improvement.....	41. 00
July 1, 1907, balance unexpended.....	902. 66

{ Amount that can be profitably expended in fiscal year ending June 30, 1909, for maintenance of improvement, in addition to the balance unexpended July 1, 1907..... 2,000. 00  
Submitted in compliance with requirements of sundry civil act of June 4, 1897, and of section 7 of the river and harbor act of 1899.

## APPROPRIATIONS.

June 3, 1896.....	\$20, 000
March 3, 1899.....	30, 000
June 13, 1902.....	7, 500
March 3, 1905.....	1, 000
<b>Total.....</b>	<b>58, 500</b>

## COMMERCIAL STATISTICS.

*Arrivals and clearances of vessels at Presque Isle Harbor, Michigan, for the calendar year 1906.*

Vessels.	Arrived.	Cleared.	Total.	Estimated net registered tonnage.
Steam.....	347	347	694	1, 626, 786
Tow.....	30	30	60	68, 900
<b>Total.....</b>	<b>377</b>	<b>377</b>	<b>754</b>	<b>1, 690, 686</b>

Decrease in vessels, 252; tonnage, 218,596.

*Freight received and shipped.*

[Tons of 2,000 pounds.]

Receipts.	Tons.	Shipments.	Tons.
Coal, hard and soft.....	3, 442	Iron ore.....	1, 923, 027
Rails and angle bars.....	2, 539	Pig iron.....	4, 786
		Lumber (1,218,000 feet).....	1, 823
<b>Total.....</b>	<b>5, 981</b>	<b>Total.....</b>	<b>1, 929, 638</b>

Total freight, 1,935,619 tons; decrease, 71,167 tons; equal to  $3\frac{1}{2}$  per cent.

Total valuation, \$5,407,598; decrease, \$778,452; equal to  $12\frac{1}{2}$  per cent.

These figures do not include tugs, scows, etc., or vessels which might have run into the harbor for shelter.

## J J 10.

IMPROVEMENT OF HARBOR OF REFUGE AT GRAND MARAIS,  
MICHIGAN.

For a history of this harbor and the work of improvement by the Government see previous reports of the Chief of Engineers, United States Army, including 1881, Appendix E E 4, page 2088, and 1871, page 131.

The pile dike which closes the natural entrance was built in 1895-1897 to prevent the wearing away of the narrow sand spit which extended to the east of the artificial entrance and arrest the movement of sand from the east, both of which agencies were gradually advancing sand bars into the harbor basin. It was also expected that with the dike in place the sand brought by wave action from the

easterly shore would be distributed along the dike and form a permanent sand spit. These results have been partially realized, and a ridge of sand has been formed along the easterly portion of the dike and is slowly forming farther west. With the aid of an allotment of \$5,000 from the appropriation for emergencies of rivers and harbors \$14,000 were expended in repairing and strengthening this dike in 1904, and when the appropriation of March 3, 1905 (\$50,000), was made it was decided that a greater portion of it should be expended in the same way. This was considered of more importance than extending the entrance piers, and led to a reenforcement of a large portion of the dike, which was done by placing an embankment of riprap behind it for a distance of 1,803 feet, and by building for another distance of 1,862 feet a second row of piles and filling between the old and new piles with cull hearts of saw logs and rock, thus making a total distance of 3,665 feet reenforced. This work was done between the dates of September 1, 1904, and August 6, 1906, under two contracts, at a contract cost of \$49,123.27, and a total cost (including administration) of not far from \$54,000. This cost is about \$10,000 more than the estimated cost given in the Annual Report of the Chief of Engineers for 1906, page 578; the excess in cost was due mainly to the settling of the rock embankment into the sand under the action of storms. Of the remaining 2,105 feet of dike, 1,015 feet is in shallow water and therefore less exposed, and 1,090 feet has a sand beach against it, some of this beach being formed as a result of the construction of the dike.

It is hoped that no further work on the dike than this will be necessary, but it is possible that the riprap will settle into the sand bottom by the action of waves and require additional rock.

The present length of the west entrance pier is 1,912 feet and of the east pier 1,545 feet. These lengths include 100 feet of pile pier at the inner end of each. The west pier is 344 feet farther into the lake than the east pier.

On account of sand movement the 22-foot curve of depth has advanced lakeward between 400 and 500 feet since the project for improvement was adopted, and this fact will entail some additional expense for pier extension to deep water.

To extend the entrance piers out to 22 feet of water, in accordance with the approved project, would now require an addition of 360 feet to the west pier, at an estimated cost of \$43,200, and an addition of 704 feet to the east pier, at a cost of \$84,480, or about \$44,512 more than the original estimate.

Some shoaling in the entrance channel has occurred since the last dredging (in 1904), soundings taken in the spring of 1906 showing a depth of 14 to 16 feet in the central width of 250 feet through the entrance. Further dredging to remove shoals is likely to be needed within the next two years.

The sand movement in front of the entrance is generally from the west toward the east, and it is important that the west pier be extended to deep water soon in order to shut off the encroachment of sand upon the channel from that direction. The extension of the east pier should be built after the completion of the west pier, and it is quite possible that its full extension will not be necessary.



Eighteen thousand dollars of the available balance, together with the sum recommended for works of improvement (\$43,200), it is proposed to expend in building the west pier of the entrance out to the 22-foot depth of water, a distance of 360 feet, at an estimated cost of \$120 per linear foot. The remainder of the available balance (\$19,643.03), together with a sum of \$20,000, will be needed for maintenance, which will be expended on repairs to piers and dike and dredging between the piers.

### Money statement.

July 1, 1906, balance unexpended.....	\$29, 188. 96
Amount appropriated by river and harbor act approved March 2, 1907.....	30, 000. 00
	<hr/> 59, 188. 96
June 30, 1907, amount expended during fiscal year, for maintenance of improvement.....	21, 542. 93
	<hr/> 37, 646. 03
July 1, 1907, balance unexpended.....	37, 646. 03
Amount (estimated) required for completion of existing project.....	45, 401. 68
	<hr/> <hr/>
Amount that can be profitably expended in fiscal year ending June 30, 1909, in addition to the balance unexpended July 1, 1907:	
For works of improvement.....	\$43, 200. 00
For maintenance of improvement.....	20, 000. 00
	<hr/> 63, 200. 00
Submitted in compliance with requirements of sundry civil act of June 4, 1897, and of section 7 of the river and harbor act of 1899.	

### APPROPRIATIONS.

June 14, 1880.....	\$10, 000. 00	March 3, 1899.....	\$25, 000. 00
March 3, 1881.....	20, 000. 00	June 6, 1900 (allotted).....	384. 32
August 2, 1882.....	40, 000. 00	June 13, 1902.....	70, 000. 00
July 5, 1884.....	35, 000. 00	Sale of United States property.....	125. 00
August 5, 1886.....	26, 250. 00	June 13, 1902 (allotted).....	5, 000. 00
August 11, 1888.....	50, 000. 00	March 3, 1905.....	50, 000. 00
September 19, 1890.....	50, 000. 00	March 2, 1907.....	30, 000. 00
July 13, 1892.....	30, 000. 00		
August 18, 1894.....	20, 000. 00		
June 3, 1896.....	24, 000. 00	Total.....	485, 723. 32

### COMMERCIAL STATISTICS.

*Arrivals and clearances of vessels at Grand Marais, Mich., for the calendar year 1906.*

Vessels.	Arrived.	Clear d.	Total.	Estimated net registered tonnage.
Steam.....	878	874	1, 752	918, 000
Tow.....	50	50	100	40, 000
Total.....	928	924	1, 852	958, 000

Increase in vessels, 98, equal to 5.6 per cent; tonnage, 31,500, equal to 3.4 per cent.

# 1866 REPORT OF THE CHIEF OF ENGINEERS, U. S. ARMY.

## Freight received and shipped.

[Tons of 2,000 pounds.]

Receipts.	Tons.	Shipments.	Tons.
Miscellaneous merchandise.....	8,000	Miscellaneous merchandise.....	175
Fish.....	1,300	Fish.....	500
Coal, hard.....	100	Lumber (32,500,000 feet).....	65,000
Coal, soft.....	7,700	Lath (9,600,000).....	8,800
		Ties, railroad (126,000).....	7,000
		Logs, cedar (50,000).....	10,000
Total.....	17,100	Total.....	86,475

Total freight, 103,575 tons; increase, 26,765 tons, equal to 35 per cent.  
Total valuation, \$2,508,375; increase, \$484,175, equal to 24 per cent.  
Logs towed in, 1,100,000 feet B. M., valued at \$16,500.

## RÉSUMÉ.

*Cost of operations on each work, both for fiscal year ending June 30, 1907, and since the commencement of operations, with total vessel freight and estimated value of same.*

Name of work.	Amount expended during fiscal year ending June 30, 1907.	Vessel freight, 1906.	
		Tons of 2,000 pounds.	Estimated value.
Grand Marais, Minn.....	\$137.02	a 30,910	\$970,083
Agate Bay, Minnesota.....	2,542.35	9,566,874	23,697,943
Duluth-Superior.....	106,156.84	b 29,171,221	251,899,844
Port Wing, Wis.....	550.56	28,611	345,488
Ashland, Wis.....	23,389.68	c 4,910,031	c 20,798,478
Ontonagon, Mich.....	499.92	d 21,411	797,047
Waterway across Keweenaw Point.....	6,119.43	e 2,682,365	102,846,779
Operating and care of same.....	9,250.00		
Marquette, Mich.....	3,887.39	3,065,014	11,795,985
Harbor of refuge, Marquette Bay.....	41.00	1,985,619	5,407,598
Grand Marais, Mich.....	21,542.93	103,575	2,508,375
Total.....	174,037.17	51,455,621	f 326,062,620

Name of work.	Date of commencement of improvement by the United States.	Total amount expended by the United States to June 30, 1907.	Vessel freight from commencement of improvement of work to January 1, 1907.	
			Tons of 2,000 pounds.	Estimated value.
Grand Marais, Minn.....	1880	\$165,686.68	292,407	\$7,890,479
Agate Bay, Minnesota.....	1887	250,657.53	69,001,817	160,790,177
Duluth-Superior.....	1867	5,021,597.92	207,396,267	2,593,135,606
Port Wing, Wis.....	1903	42,018.96	241,073	3,169,756
Ashland, Wis.....	1887	349,164.63	65,062,481	485,029,682
Ontonagon, Mich.....	1867	363,525.52	2,787,671	74,766,002
Waterway across Keweenaw Point.....	1891	1,325,347.86	28,697,490	755,412,142
Operating and care of same.....	1891	169,307.64		
Marquette, Mich.....	1867	667,874.46	37,330,369	165,665,765
Harbor of refuge, Marquette Bay.....	1897	67,597.34	15,290,845	40,120,397
Grand Marais, Mich.....	1880	448,077.29	1,336,259	20,497,866
Total.....		8,860,840.82	422,465,679	4,306,477,872

a, b, c, d, e do not include logs as follows: a 17,000,000 feet; b 28,900,000; c 36,000,000; d 8,850,000; e 5,603,000; total, 94,153,000.

f Largely freight passing through the canals.

Does not include value of logs for 1906, amounting to \$1,410,295.

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